February 10, 1958

Paper Trade Journal

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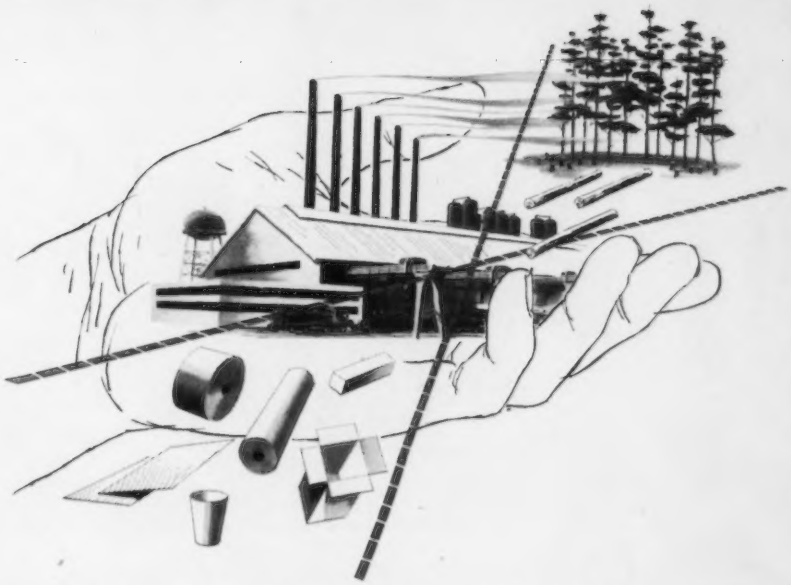

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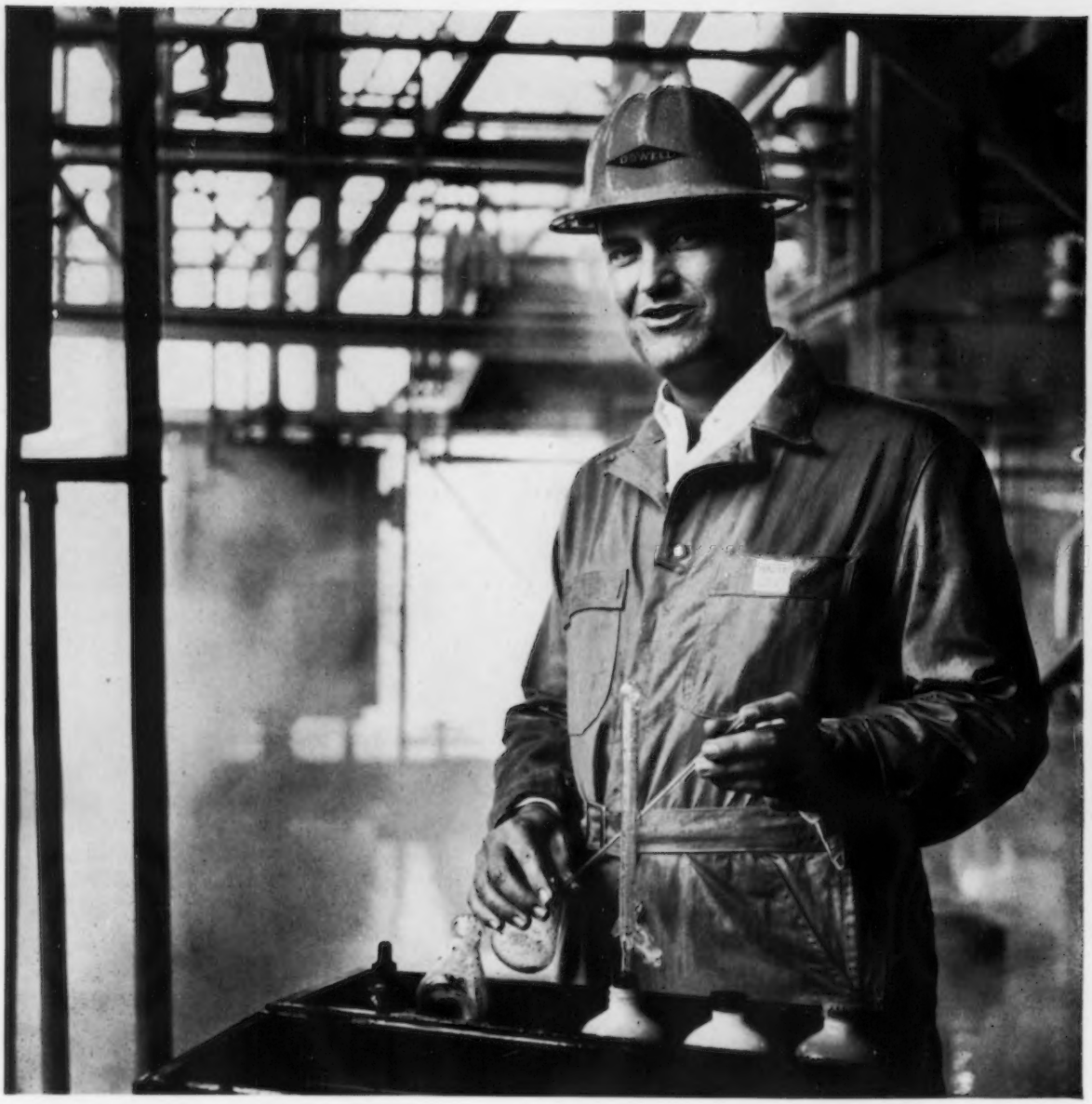

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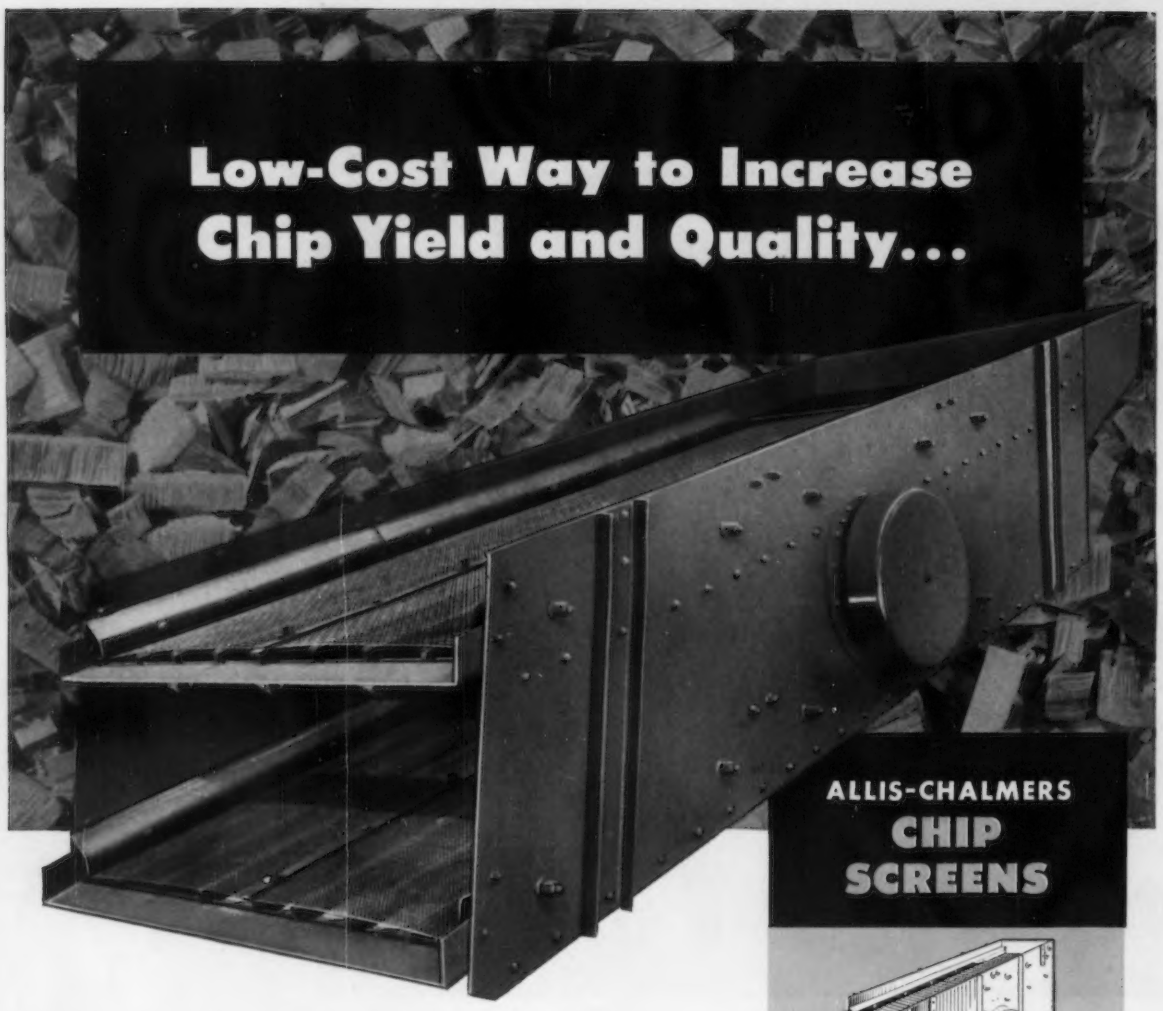
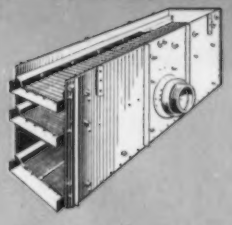
Low-Cost Way to Increase Chip Yield and Quality...

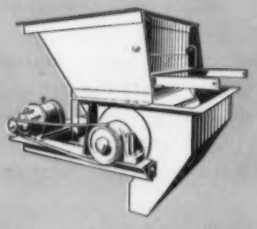


ALLIS-CHALMERS CHIP SCREENS



Triple-deck screen increases efficiency

Top deck removes slivers; second deck relieves load so that a maximum of pin chips, dust and dirt may be removed.



Chip screen feeder provides full width feeding

Screening is more efficient, more profitable, because *all* of the screen area works *full* time. Eliminates surges.

Increased Yield — In this Allis-Chalmers screen, the accurately balanced mechanism imparts efficient vibration to the entire screen surface and body structure. As a result, chip travel is uniform, stratification rapid. Capacity is further increased because apertures remain open. A feed spout spreads feed over entire screen width, turning slivers on their sides as they are conveyed onto screen surface, thereby increasing efficiency. Protection against blinding of the chip dust deck may be obtained through the installation of a *Sta-Kleen* deck.

Improved Quality — Allis-Chalmers chip screens also help you maintain positive control over pulp quality. Because of the efficient circle-throw action of the mechanism an unusually high percentage of chip dust and dirt is removed.

Low Cost — Best of all, there is long-term economy in installing an Allis-Chalmers chip screen. The initial cost is low. Power requirements and maintenance are kept at a minimum by the simplified two-bearing mechanism.

Allis-Chalmers also offers horizontal screens for limited headroom applications. For complete information, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B6353B.

Sta-Kleen is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-5515

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Feb. 16-21: Paper Week in New York.

May 14-16: TAPPI Coating Conference, Bedford Springs Hotel, Bedford Springs, Pa.

June 2-4: Technical Section, CPPA, Summer Meeting, Chateau Frontenac, Quebec City.

June 3-5: Superintendents' Assn. Annual Meetings, Statler Hotel, Boston, Mass.

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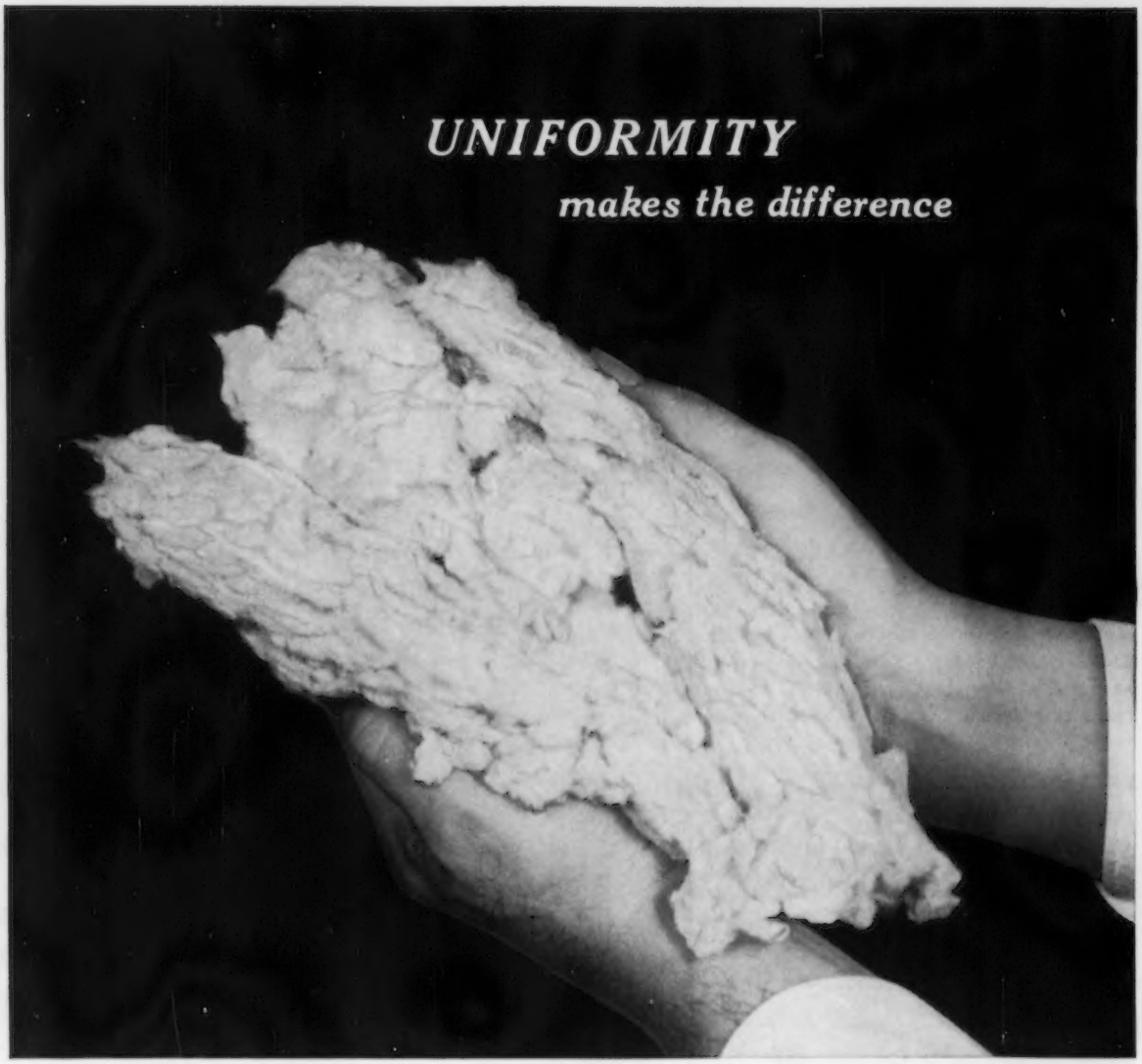

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The Sandy Hill plant, in the foreground of the industrial center of Hudson Falls, N. Y., is located on the banks of the scenic Hudson River.

SANDY HILL MARKS 100 YEARS OF PROGRESS WITH PAPER AND PLANS ACCELERATED FUTURE GROWTH

Now celebrating the start of its second century of progress in designing and building machinery for fiber production and sheet forming, the Sandy Hill Iron & Brass Works of Hudson Falls, N. Y. has pioneered for 100 years in service to the American papermaker.

From the early beginning as a local company, supplying the paper mills of New York State and New England, Sandy Hill today enjoys international renown as a source of fine papermaking machinery. Its products are operating in almost every state of the Union . . . in Mexico, Brazil, Peru, Argentina, India, China, Sweden, France, Belgium, Italy, the Union of South Africa, Portugal, Austria, Canada, Cuba, Korea, Uruguay . . . in fact, throughout the world.

Located Near Early Paper Mills

In 1768, Albert Baker of New York, the first white settler, built a dam and water-powered sawmill at the foot of a sandy hill beside the Hudson River's highest falls. These falls, since known as Baker's Falls, attracted other projects and in 1844, the first manila paper mill in the United States was built there. In 1858, the Baker's Falls Iron Machine Works, predecessor of The Sandy Hill Iron & Brass Works, was established by Philip Wait, an inventor of considerable prominence, and his plant became a leading producer of water turbines. More paper mills were built in this immediate area in the years that followed.

The size and importance of the huge paper mills in the very dooryard of the Baker's Falls Iron Machine Works led quite logically first to repair and

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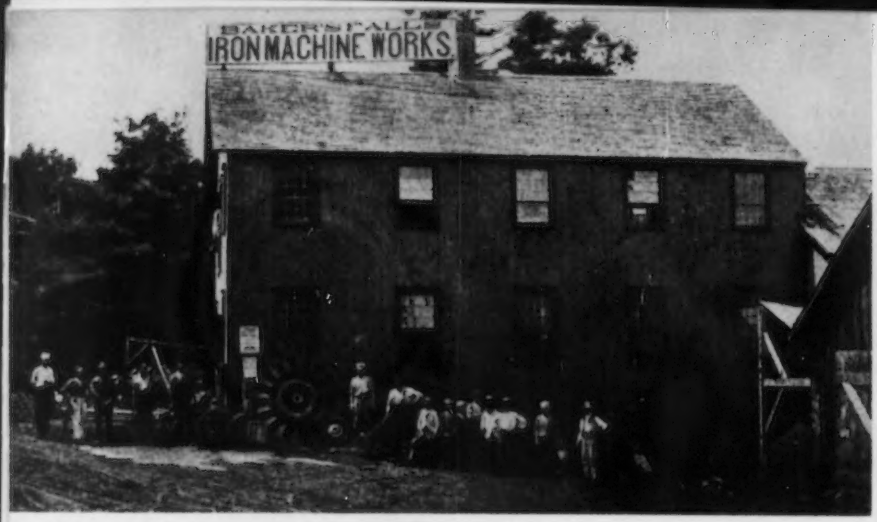
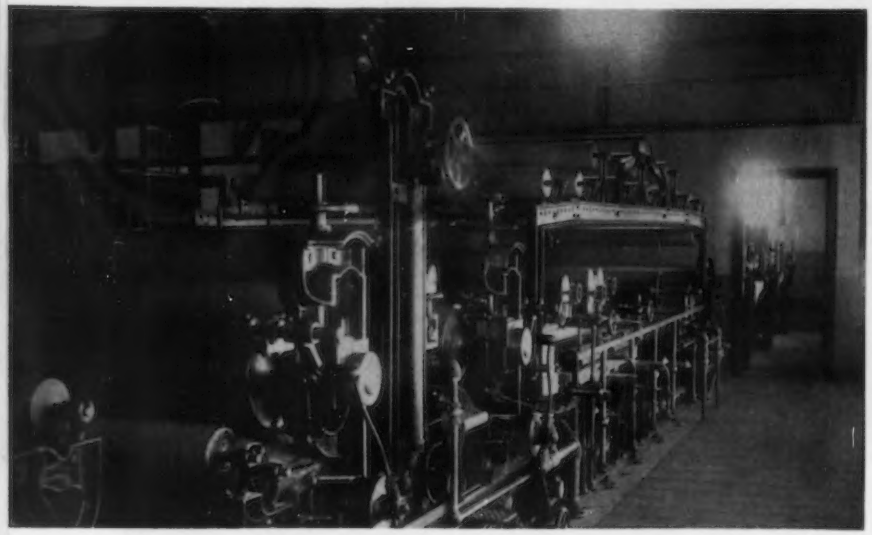
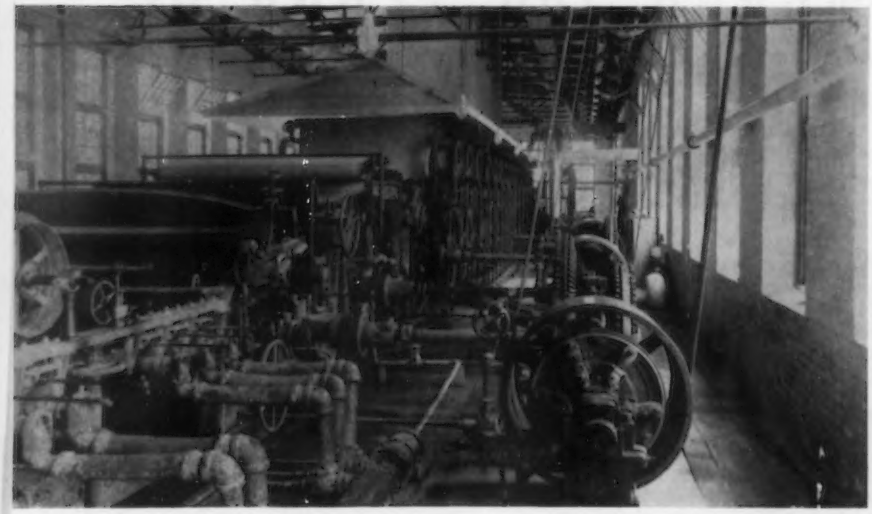


Early photograph of the original Sandy Hill employees and plant, known at that time as the Baker's Falls Iron Machine Works.



An early complete fourdrinier machine produced by Sandy Hill, bearing an 1886 date on the cross bar above the top roll.



Another view of an early fourdrinier installation, showing the then revolutionary drive, forerunner of today's efficient selective drive.

replacement work in these mills and then to the development of special machinery for them. It was not long before the firm was designing and building complete paper machines.

Around 1874, Francis M. Van Wormer and Thomas E. Wells purchased the company and operated it as a partnership. In 1882, Otis A. Tefft (grandfather of Dr. Richard C. Tefft, Jr., a member of the Board of Directors of The Sandy Hill Iron & Brass Works since 1919 and Chairman of the Board since 1939) and N. E. Packer bought Wells' interest in the firm and the name of the company was changed to Sandy Hill Iron & Brass Works. New brick buildings arose.

Present Name Adopted in 1897

In 1897, the business was incorporated and "The" prefixed to its name. An expansion program was launched under the direction of its new officers: Francis N. Van Wormer, president; Richard C. Tefft, Sr., vice-president and secretary; and Charles T. Beach, treasurer. N. E. Packer was named shop superintendent. It was a management of the highest integrity and was primarily responsible for the early establishment of Sandy Hill's reputation as a source of solid, honest and efficient machinery.

In 1906, Will Packer, son of N. E. Packer, perfected the Packer Open Side Screen which revolutionized traditional methods of dirt removal and fiber grading. The Packer Screen won such wide acceptance that it soon dominated the flat screen field and the word "Packer" became synonymous with "flat screen."

In 1934, an alliance was formed between Sandy Hill and Kamyr in Sweden. A/B Kamyr is a sales and development organization with manufacturers in several countries, including three leading Scandinavian manufacturers of pulp and papermaking machinery. A broadened contract in 1946 brought a Kamyr engineering technician to Sandy Hill as manager of the pulp division and led to the rising importance of the company's Pulp Bleaching Division.

Modernized by New Management

In 1936, following the death of A. J. Kennedy, company president between 1919 and 1936, a new management, headed by the late Frank A. Juckett as president, came to Sandy Hill. It was a group of vigorous, enthusiastic and capable men who instigated an immediate program of modernization of existing lines and adding a new and diversified line of machinery.

In 1949, a working agreement was reached between Sandy Hill and Canadian Vickers of Montreal. It provided that all Sandy Hill-designed paper ma-

[ADVERTISEMENT]

Present day scene in one area of Sandy Hill's mammoth machine shop, which contains a full complement of the most modern machine tools and has a capacity for the simultaneous production of a variety of complete paper machines and other papermaking equipment.

chinery sold in Canada would be built by Canadian Vickers. Sandy Hill also works closely with Paper Machinery Ltd. of Montreal, agents for Kamyr equipment in Canada.

During World War II, Sandy Hill undertook the production of towing winches, minesweeping equipment, gun mounts and LST stern anchor handling gear and other items for the armed forces. During almost 4 years of intense work, the shop was never closed and some men worked as much as 96 hours a week. Sandy Hill produced its first winch in 6 months; the last took less than a day to build. So outstanding was the company's record in the war effort that the firm was awarded the coveted Navy "E".

Post-war reconversion produced little change in activity at Sandy Hill. Many orders for specialty equipment, innumerable paper machines and components which had accumulated during the war period taxed the war-augmented plant and engineering facilities. A war-instituted program of on-the-job training has continued and has been maintained with increasing vigor, thus assuring the company of a steady flow of thoroughly trained craftsmen and engineers.

[ADVERTISEMENT]

Improvement Program at Peak in '58

Sandy Hill's centennial year will see completion of a tool and facility improvement program that has marked the past 10 years as a time of concentrated modernization in shop arrangement, plant facilities and manufacturing techniques.

The program has called for foundry modernization, including development of a new molding technique for dryers, new equipment for cupola charging and for casting cleaning.

In the shop, this program has included the addition of new high-speed, heavy duty lathes, boring mills, a new modern roll grinder, specialty machinery for machining dryers and for fabricating and machining plant washers.

To help the papermaker produce better paper to meet today's highly competitive market, Sandy Hill is prepared both by know-how and equipment to produce rolls ground to very fine toler-

Sandy Hill engineering group includes: (l to r) P. W. Martineau, asst. chief eng.; J. J. Fusco, chief draftsman; A. G. Bellos, chief eng.; E. C. Burns, asst. chief eng.; G. E. Clink, chief development eng.

On-the-job training program culminates with the awarding of journeymen diplomas to graduating class of machinists.

Above: Dr. Tefft and J. Wesley Joslyn congratulate 50-year employee Ernest Waters, Plant Superintendent, after award presentation at annual company banquet. Below: The Sandy Hill annual picnic is a family affair, typical of the many activities which are completely planned and produced by employees.

ances and balanced to run at high operating speeds, and dryers cast to meet any code requirements. Its new inspection quarters are equipped with the finest precision instruments to assure adherence to top quality manufacturing standards.

Sandy Hill is a progressive organization with a management which realizes that business survival is dependent upon a research and development program abreast of the technological progress that has brought the paper industry, in a span of one generation, to its place as the country's fifth largest industry. And Sandy Hill has just such a program.

The Sandy Hill Iron & Brass Works' engineering and manufacturing standards and plant facilities are geared to meet the challenge of the next hundred years to the same degree of customer satisfaction as has so successfully marked the company's first hundred years.

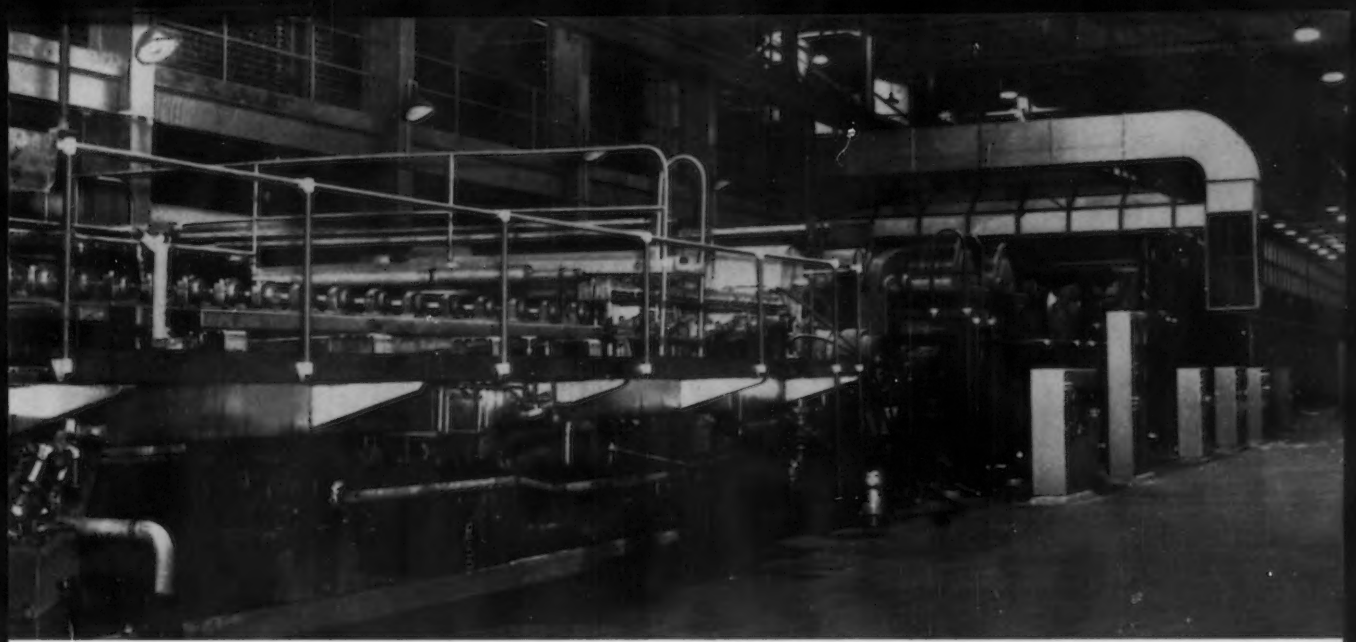
Cite Employee Relations

One of the factors which has contributed in a large degree to the success of the Hudson Falls corporation is a "family" relationship among the employees, extending from the president's office to the worker at the other end of the scale. The company's attitude is illustrated by this quote from the popular "Chips" publication, an employee house organ which boasts circulation far beyond confines of company employees:

"There is no factor in industry which can contribute more to its success or do more to hasten its downfall than the relationship between management and employees. The dignity of the individual and the general welfare of the employees are of paramount concern to the Sandy Hill management. The fact that our employees are aware of this concern and believe in its sincerity is likewise important."

That this is a "working" concept is shown by such fully employee-sponsored activities as the Sandy Hill Club, Sandy Hill Beneficial Association, Credit Union, Blood Donors Club, Annual Picnic and Musical Shows, to mention only a few. All of these efforts have been spontaneously organized, developed, and are enthusiastically supported by the employees, symbolic of an unparalleled spirit of co-operative interest that exists in this unusual organization.

That this attitude is reflected by management is best documented by an announcement at the recent employees' dinner, the kick-off of the centennial celebration, to the effect that every employee of the company was to receive



Typical fourdrinier and dryer section installation, of modern, high speed design, which Sandy Hill is producing today.

twenty shares of the Sandy Hill Class A Participating Preferred Stock.

This enthusiasm and interest on the part of all employees extends to a conscious pride in the quality of their work and products, with workers showing considerably more interest in end uses of their craftsmanship than is normally encountered in industry. That this has resulted in a company reputation for exceptional quality and service is no surprise, and is apparent in many customer relationships. As a chief engineer for a leading Eastern paper mill recently commented;

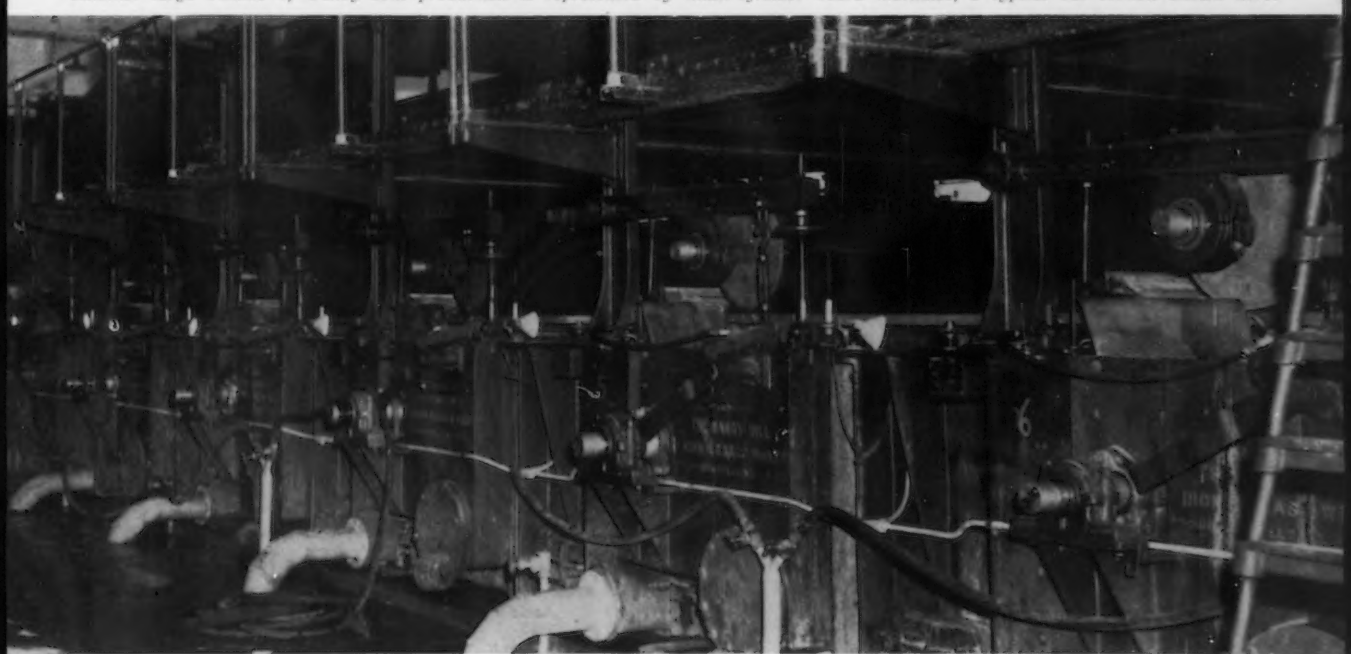
"I think one of the main reasons why we always looked first to Sandy Hill was because we believed Sandy Hill treated our problems as if they were their problems."

Complete Machines Head List

Sandy Hill's first century of progress in the manufacture of papermaking equipment finds the firm with an enviable list of products, representing many outstanding engineering achievements in machinery for the production of all types of pulp, paper and boxboard. Heading this list are complete fourdrinier and cylinder machines, constituting a major part of annual production.

A pioneer in the design and manufacture of fourdrinier machines, Sandy Hill points to a number of these machines, installed long before the turn of the century, which are still operating profitably today. Current fourdrinier production is concentrated on these standard combinations: 1. Newsprint and kraft machines; 2. Machines for book, bond and other fine papers; 3. Machines for rag and specialty papers; 4. Yankee machines for facial tissue; 5. Yankee machines with after dryers for towelling. In addition, other custom designs are available for special applications.

Another large volume of Sandy Hill production is represented by multi-cylinder board machines, a typical vat section shown here.



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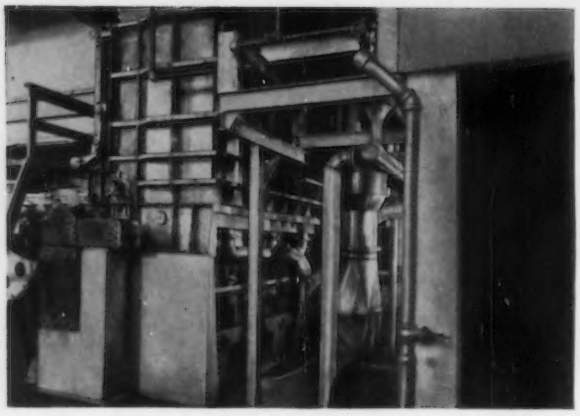
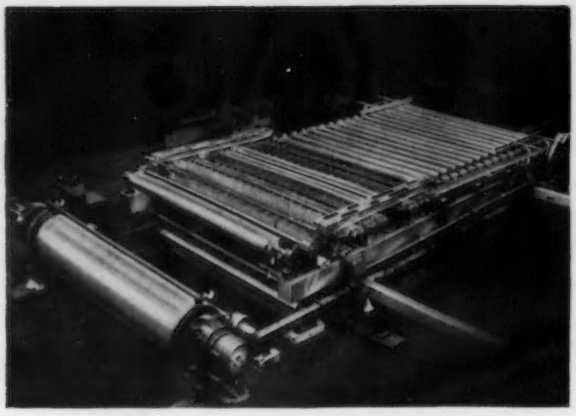


FLOW CONTROL UNIT with multiple manifold distributor and recirculation. This unit gives improved uniformity of delivery into the pond, and together with the specially designed slice gives the optimum in uniform profile, all this at stepped-up speeds.



FOURDRINIER. The Sandy Hill removable fourdrinier permits varying components for making the entire range of fine papers. Structurally strong, simple in design, it requires least manpower motion and involves least hazard to wire during wire changes.

Multi-Cylinder Machines

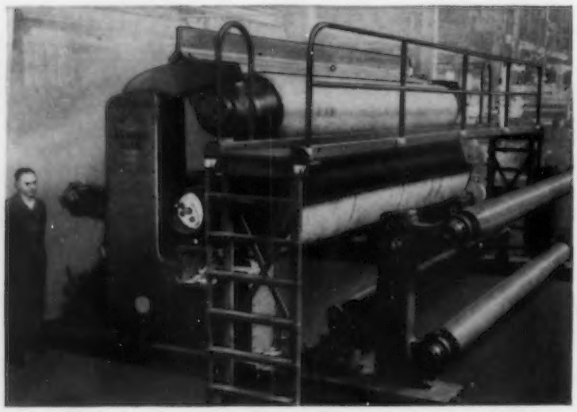
The multi-cylinder board machine has also been one of Sandy Hill's strong product features during the last 70 years. It has introduced a number of details of special Sandy Hill design, including variable position cylinder moulds, adjustable slice, short center design press stands, open side calenders, and many others. Design features such as the elimination of reverse bends in felts, arrangements for quick felt change, and exceptionally sturdy press and dryer frame construction have also been incorporated. These machines, available with an optional number of vats, various dryer arrangements, an improved constant speed reel, high speed unwinding stands, together with the necessary control instrumentation, have provided the board industry with simple, highly efficient equipment to meet the demands of the modern market.

Dryer sections, for both fourdrinier and cylinder machines, have long been recognized as one of Sandy Hill's most effective areas of manufacture. The firm provides a wide variety of designs to meet every operating requirement, incorporating a number of exclusive features. Basically, they are designed for the most efficient use of pressure and heat, combined with sound principles of condensate removal. These dryers have also been renowned for their high safety factors, long before the day of state and insurance codes.

Components for Modernization

In addition to complete machine manufacture, Sandy Hill has placed tremendous emphasis on the production of improved component parts for existing paper and board machines, utilization of which has permitted operators to alter and modernize present equipment to an extent that it is truly competitive with completely new machinery, at a fraction of comparable costs.

Starting at the wet end of the machine, these components include such Sandy Hill specialties as the Bertrams



SUCTION PRESSES—Hydraulically operated suction presses are available designed for pressures up to 1,000 pounds per linear inch of nip.

DRYERS—The Dryer Section, often the bottleneck in a modernized paper machine, is no problem when an additional nest of Sandy Hill Dryers is installed. Sandy Hill's pressure tested Dryers have more capacity per unit, so that a smaller number of Dryers meets the requirements for speeded-up production.

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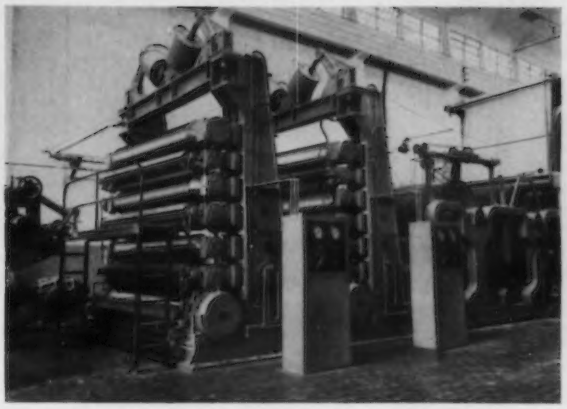
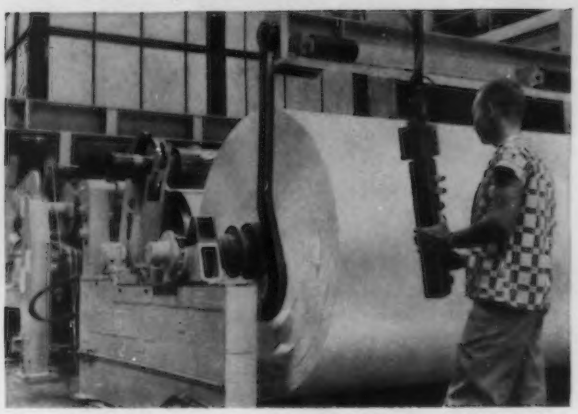


CALENDERS—Sandy Hill's open frame calenders are fabricated from steel plate, feature iron rolls with a depth of chill to withstand years of grinding.



REELS—Sandy Hill offers lightweight Reels for tissues, etc.; standard Pope type Reels for most types of paper; and hydraulically controlled heavy Reels for board or heavy pulp.

flow control unit with multiple manifold distributor and recirculation for best delivery to the pond; an improved slice design to permit the most uniform flow of stock to the fourdrinier unit.

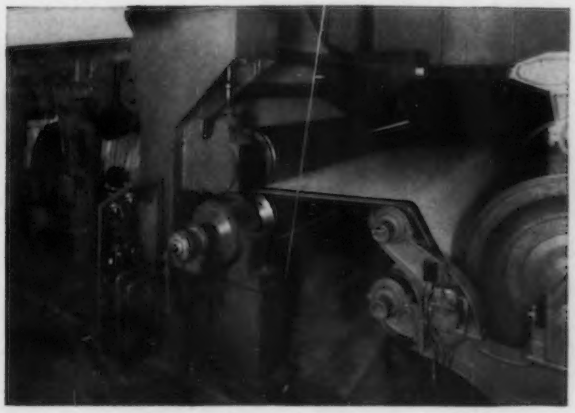
This latter unit is available in either the non-removable or removable fourdrinier, the latter combining structural strength with simplicity of design requiring minimum effort and the least hazard to wires during changes.

Press sections are offered which employ all of the most advanced engineering to provide nip pressure up to 1000 pounds per linear inch or more, with framing to conform. In this area, too, the Scofield conditioning system is enjoying constantly increasing popularity, available in a variety of combinations of the Scofield Felt Conditioner, Scofield High Pressure Shower and the Scofield Venturi Throat Suction. This system has proven extremely beneficial in providing added felt life and permitting increased machine speeds with lower water consumption and reduced shut-down time for cleaning and changes of felts.

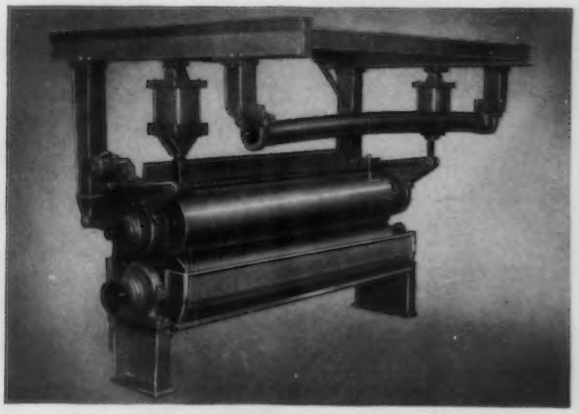
Components for the improvement of cylinder machines are centered largely in the field of Sandy Hill's advanced designs in Cylinder Mould Vats with movable cylinder moulds, Sandy Hill Bertrams Flow Distributor, and other exclusive features.

In the dryer section, Sandy Hill offers a selection of top-rated standard units, plus special designs for size presses, breaker stacks and smoothing presses. New designs in calenders and reels are also available, including the new Rola-Reel. This is a unique new constant speed horizontal paper reel with a trochoidal movement which permits the reel carriage to roll without sliding, virtually eliminating friction. The Rola-Reel also offers new accuracy in control of nip pressures and embodies a simplified paper transfer which allows the operator to select the paper transfer from vertical, downward, together with other features.

Another outstanding achievement of the firm's engineering department is the



BREAKER STACKS—Properly located in the dryer section, this Breaker Stack insures best results in compacting the sheet and final fiber migration control. Designed for high nip pressures, it operates successfully on high grade printings.



SIZE PRESSES—Installed on existing machines by moving dryers, these Size Presses give improved performance in sizing or pre-coating high grade papers. Overhead loading and rolls that withstand chemical action are features.

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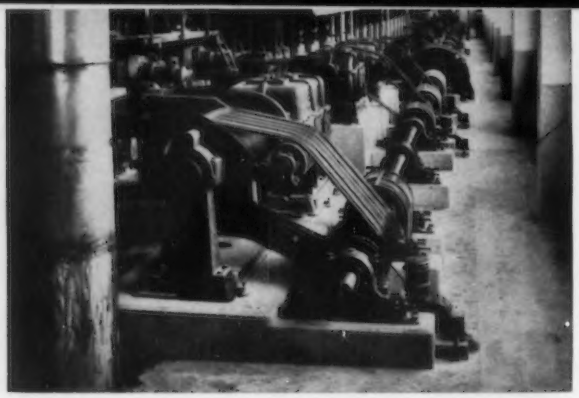


SELECTIVE DRIVE—Increased range and control of draw, economy of space and maintenance, and unvarying draw between sections are recognized features of the Sandy Hill Selective Drive.

CONDITIONER—The Scofield felt conditioning system is one of the most widely used in the industry. Shown here are the traveling jet conditioner, shower, and venturi throat suction units which comprise the system and can be used in various combinations

Sandy Hill Selective Drive, considered by many papermakers the perfect answer to the need for an unvarying draw between sections. Embodying the most modern ideas in power transmission, it provides a fineness of draw regulation and exact draw maintenance, combined with simplicity, power saving and low first cost.

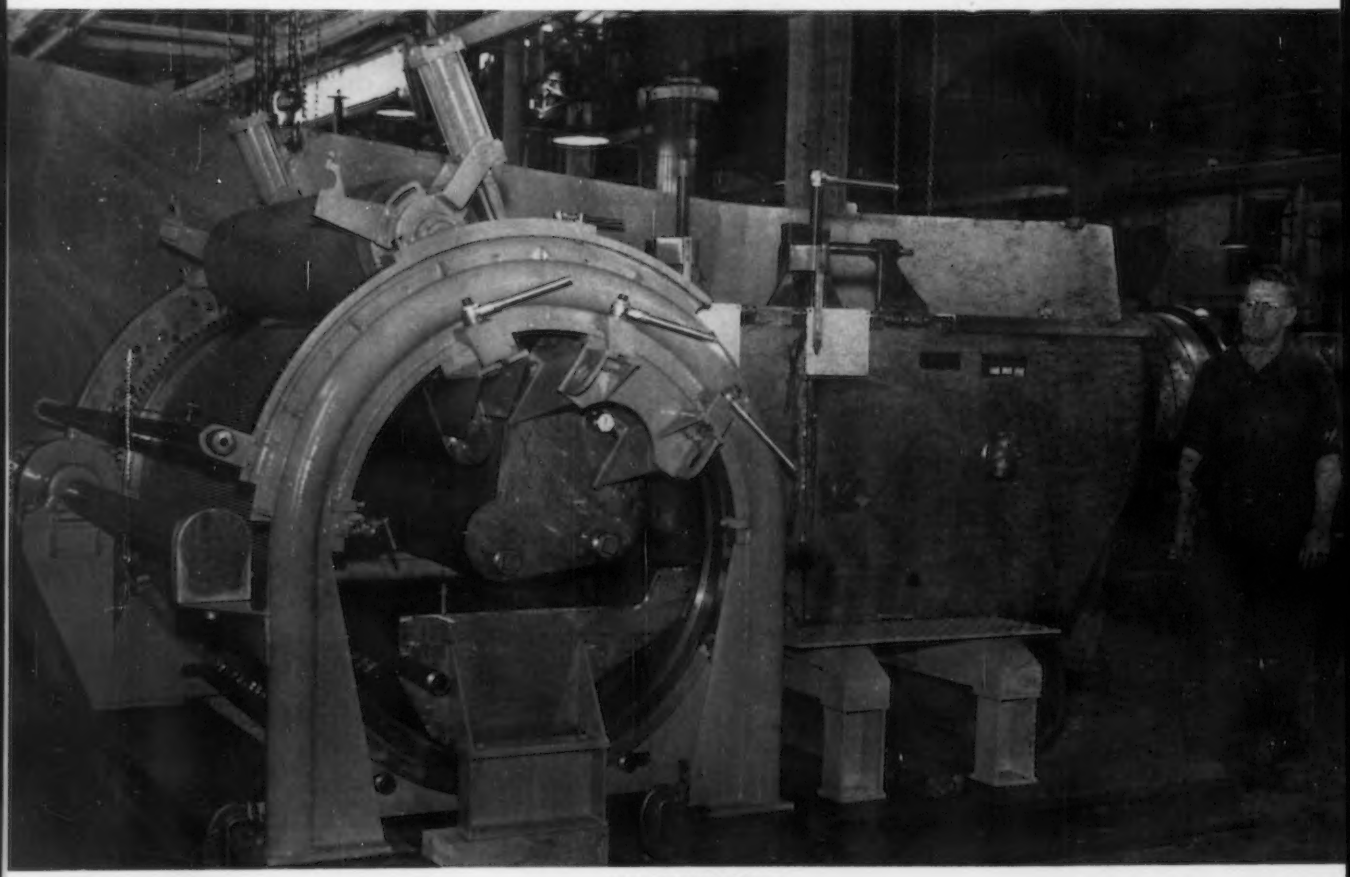
Rotoformer Spectacular Producer

In 1947, Sandy Hill developed a new method of forming pulp and paper, resulting in what is now known as the "Rotoformer." With fourteen installations in successful operation on a range of products from corrugated wrapping to filter papers, this machine shows every indication of becoming an extremely important factor in the industry.

The Rotoformer consists of a spiderless perforated cylinder, covered with the proper mesh wire for its particular purpose. It has been described as a rotary fourdrinier. In function it operates as a cylinder mould, excepting that there is no circle or vat, the stock being presented to the side of the mould and coming off at the top or to the side away from the oncoming flow.

The machine arrangement can be such as to deliver the sheet under a fly roll to a press section such as in the case of a fourdrinier; it can be set up in a similar fashion with a pick-up felt; it can be set up as a standard cylinder mould would be on a wet machine or straight through as a vat on

ROTOFORMER—One of Sandy Hill's most advanced contributions to papermaking, providing a new method of forming pulp and paper.



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KAMYR BLEACHING—Considered the standard of the industry, the Kamyr continuous bleaching process is used by more plants throughout the world than any other. A washer floor with all controls for operating the complete bleach plant is shown in this photograph.

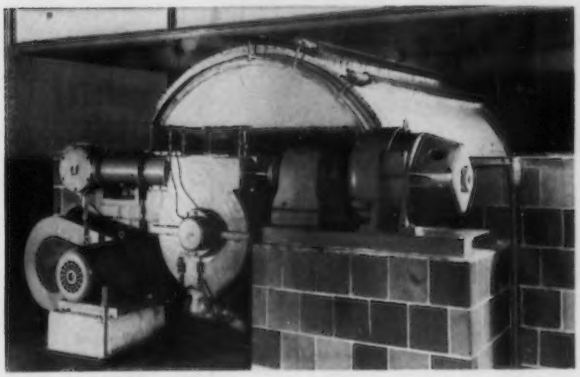
a multi-cylinder machine. Rotoformers have been installed to operate as alternate wet ends or combination wet ends. One is mounted over a press section and operates in combination with a fourdrinier with the combining at the first press; another is arranged as a fourdrinier and operated alternately with a cylinder mould vat section.

The Rotoformer is adaptable for many forms of paper. Weights and strength sufficient to come off in a straight through manner will be handled very much as on a fourdrinier; in the case of thin papers such as tissue, and on multiple ply papers, a pickup felt may be used.

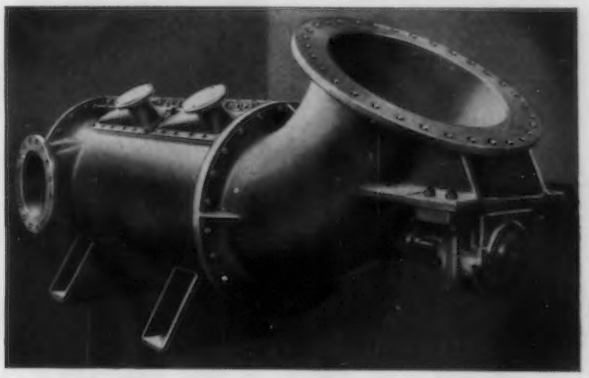
Forming characteristics have been recognized as producing excellent profile. Beta Ray tests show that the sheet profile on the Rotoformer is generally better than produced by either fourdrinier or cylinder machine. (A scale model of the Rotoformer will be on display at the TAPPI and APPA Convention, Feb. 17-20, in the Sandy Hill suite, Rooms 533-535-537, Biltmore Hotel.)

KAMYR Continuous Bleaching

One of the most widely accepted items of Sandy Hill manufacture is the KAMYR Bleaching System. Used by more mills throughout the world than any other system, this patented bleaching system is controlled and produced



VACUUM WASHER—Meets any demand for capacity, efficiency and resistance to corrosion. Patented, automatically loaded sealing valve gives constant uniform loading pressure. Self-aligning, it minimizes wear and maintenance.



CONCENTRATOR—Is an enclosed screw press with a cylindrical strainer. A constant consistency of 4 to 6% enters the concentrator while outgoing pulp is approximately 18%. Controls outgoing consistency by metering the return surplus liquor.

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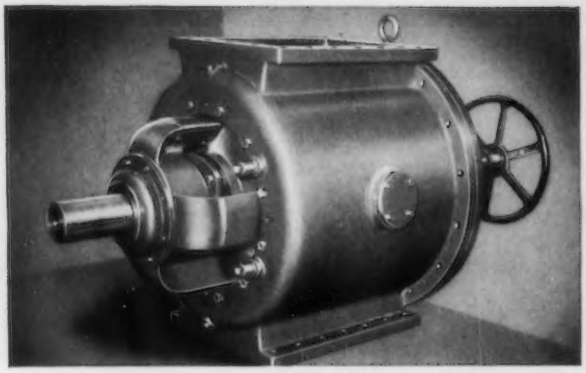
RADIAL FLOW MIXER—Produces thorough mixing of stock and chemicals even at high consistencies. Also acts as a distributor and discharges the pulp evenly 360° over the tower bottom. Transverse force eliminates channeling or areas of dead stock.



ROTARY FEEDER—A multi-pocket sealing device basically of cast-iron construction. Serves both as a seal and as the pulp transfer medium between the atmospheric pressure above it and pressurized section below.

exclusively for U. S. mills by the Sandy Hill Iron & Brass Works.

The still standard upflow tower for the chlorination stage was invented by Kamyr in 1934, covered by American patent rights issued in 1937. The downflow tower was invented in 1939 and subsequently patented, as have the many improvements to the system which have been added in the intervening years. This development reached another stage with the invention of the high density upflow tower in 1953, which, added to previous designs, gives the paper industry a bleaching system which has become the standard of modern methods.

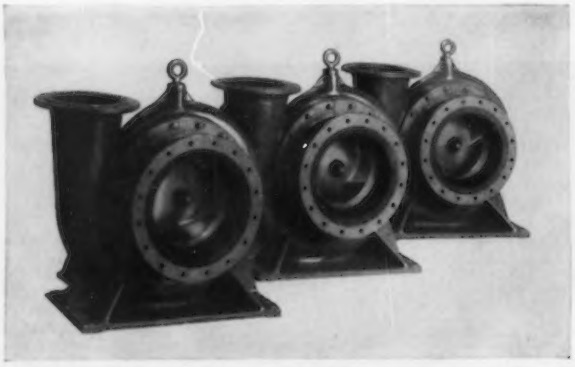
Component parts of the KAMYR system include advanced designs in chlorine mixers, circulation pumps, scrapers, vacuum washers, steam mixers, dilution nozzles, stock transport pumps, rotary feeders, radial flow mixers, concentrators, etc. Most of this equipment is of exclusive KAMYR design and patent, available only through Sandy Hill in this country.

One of Kamyr's outstanding points of superiority has been its method of continuous chlorination. Johan Richter, who has been credited with contributing more than any other man to advancement in pulp processing, and K. W. Rosen, solved the problem of efficient mixing and absorption of chlorine to open the way to the continuous chlorination process. Richter and Rosen placed the standard Kamyr Type CR circulation pump at the bottom of a tower to produce a strong horizontal circulation of the stock to provide a good mixing and equalizing effect.

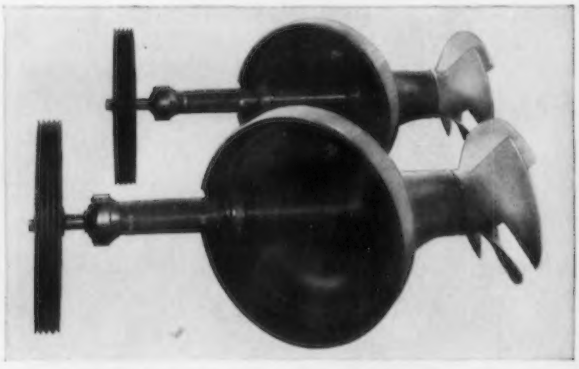
Kamyr's patented pre-impregnation process, which provides for the mixing of pulp and chemicals at low consistency and subsequent treatment at high consistency, has been rated by many experienced pulp producers as best for the production of high grade dissolving pulp.

Kamyr's special high density storage system, with automatic operation, employs a surge tank between the storage tower and the consistency controls. When the stock reaches the upper level control instrument in the surge tank, the flow of stock from the tower is cut off automatically. The flow of stock is then automatically resumed when it reaches the low level control instrument. The setting remains constant for the nozzle openings and for the valve controlling the flow of stock out of the tower.

Kamyr's stock blending chest design offers special features to provide effective mixing and especially to avoid dead surface stock.



STOCK TRANSPORT PUMPS—Designed to insure an even delivery of pulp stocks and slurries. Specially designed air expelling feed pump is also available for higher consistencies at low head. Sturdy, dependable and free from breakdowns, they are wide favorites.



CIRCULATION PUMP (TYPE CT)—Low density pulp in the bottom of a Downflow High Density Tower is kept in circulation by this special Kamyr Pump. Propeller designed to provide excellent circulation and permit rapid start-up after shutdown.

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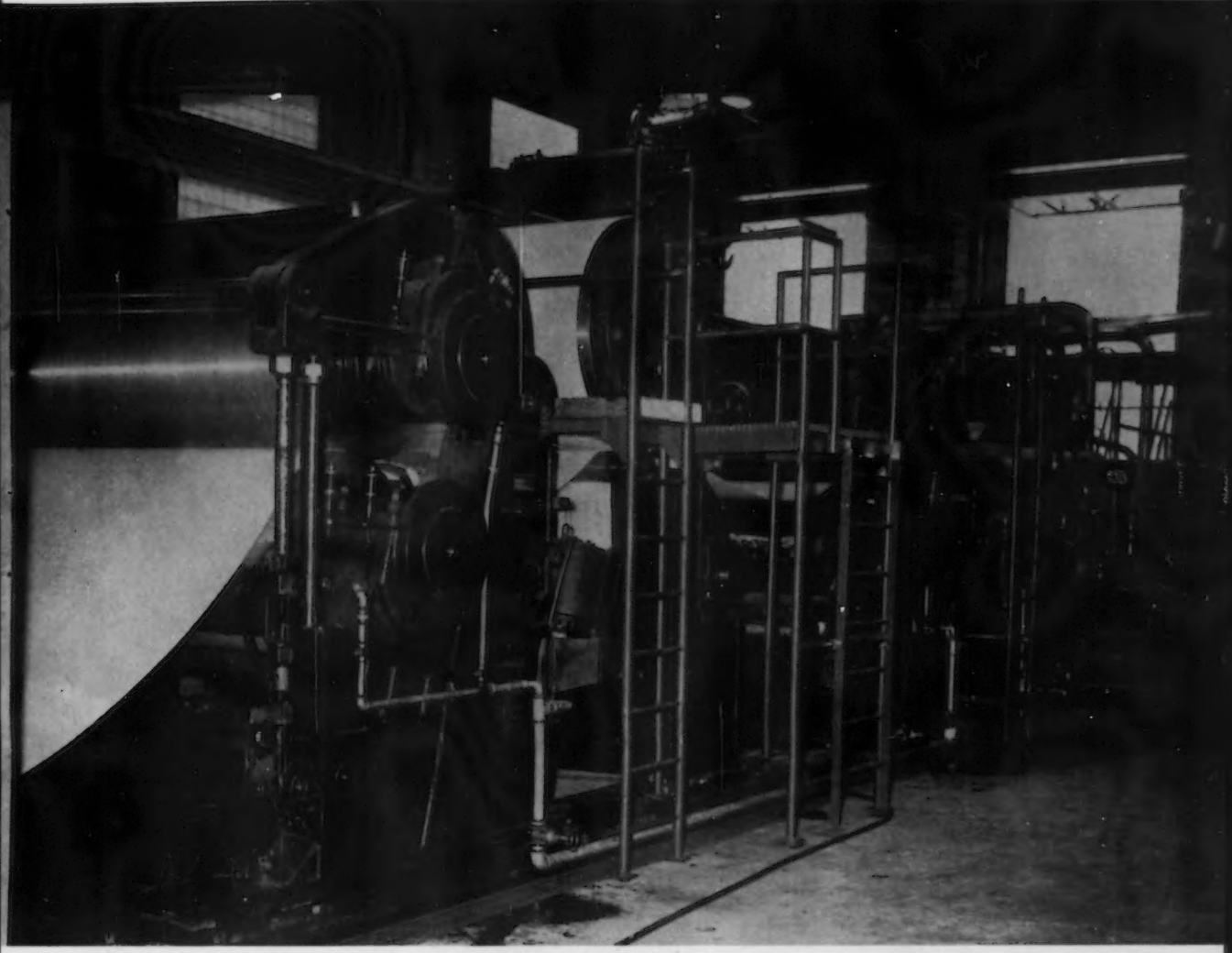


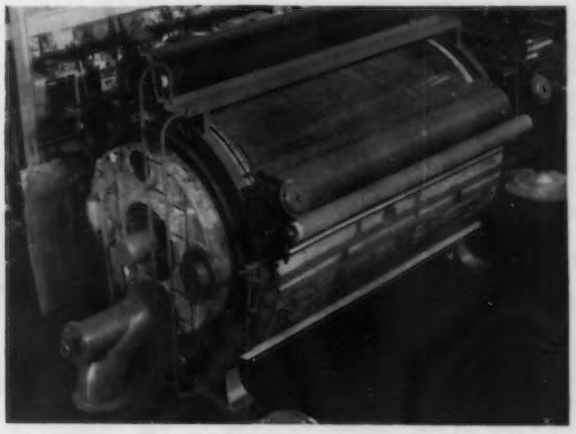
KAMYR WET MACHINE—Another Sandy Hill specialty which has become an important factor in modern pulp forming through the "feltless" method.

KAMYR Wet Machines

In 1918, KAMYR produced the world's first feltless wet machine, and throughout the years of research and development which have followed, the word KAMYR has become synonymous with the feltless wet machine. This method of pulp forming has been proved to produce the driest sheet, with a dryness ranging between 55 per cent and 60 per cent air dry coming off the second press.

The value of these Sandy Hill-produced KAMYR machines is based on substantial savings in felts, wire, upkeep, operating labor, space and freight. Placed ahead of a stack of dryers, they effect great savings in steam cost, save fibre and make clean, modern and economical installations. The operation is

PRESSES—Kamyr Wet Machine Presses are designed to produce highest water removal through exceedingly high nip pressures, grooved press rolls, proper sheet introduction to the press and adjustable water doctors.



KAMYR VACUUM MOULD—Through the design of the vacuum system and the use of grooved pressure rolls, produces a much heavier pulp sheet than is possible on a conventional cylinder.

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Sandy Hill management team holds typical "shirtsleeve" session. Left to right: Allen A. Lowe, asst. vice pres.; Loren G. Gallup, vice pres.; Nils Klykken, vice pres. and mgr. pulp machinery div.; J. Wesley Joslyn, first vice pres.; J. Walter Juckett, president and gen. mgr.; L. G. Brockelsby, sec. and treas.; Arthur J. Parent, Jr., vice pres. and comptroller; and Harold G. Fulmer, asst. treas. and asst. sec.

continuous, and pulp is produced in sheets of uniform consistency. In addition, the KAMYR Vacuum Mould produces a much heavier pulp sheet than is possible with a conventional cylinder. This heavier sheet is sufficiently densified on the mould to be self-supporting between the mould and the press.

Since one KAMYR Wet Machine has in many instances replaced four to six other wet machines and made hydraulic presses and accessories unnecessary, it is only logical that this type of machine has become the leader in the field.

Sandy Hill Future Plans

Management and employees of The Sandy Hill Iron and Brass Works look forward to the future with the same optimism and enthusiasm which have been a part of the organization during the past century. Despite the tremendous strides made by the industry during the last "Golden Century of Paper Progress," Sandy Hill feels that even greater horizons lie ahead in this country, and to an even greater degree in other, less advanced countries throughout the world.

Accordingly, plans are well under way for future development. Sandy Hill's reservoir of trained manpower in both engineering and crafts, in modern machine tools, in pattern shop and foundry facilities and erection area are all geared to meet the exacting requirements of the future.

The familiar Sandy Hill trademark is symbolic of the emphasis which the firm places on the importance of the worker, an attitude largely responsible for the enthusiastic spirit of teamwork which permeates the company's activities.

In addition, the company has instituted a comprehensive program for research and new product development. Sandy Hill's president, J. Walter Juckett, has summed up future planning as follows: "Sandy Hill engineers are currently developing workable designs of certain sections of paper and pulp mill machines for better quality, greater capacity and higher speeds. To meet the requirements of future manufacturing plans, the company has already ordered considerable new equipment and is committing itself for additional machine tools as required. Architectural plans have been completed for shop expansion, and other activities have been coordinated to meet the future growth of capacities and anticipated production. The industry may rest assured that many more developments of considerable interest will be forthcoming from Sandy Hill during the current centennial year and in years to come."

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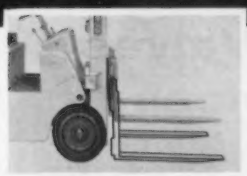

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TowmoTorque Drive offers you cushioned "creep" control unequalled in the industry today. Driving ease is more than tripled when you add Towmotor Power Steering.

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Towmotor balanced weight distribution assures full traction with or without load. Positive-action hydraulic lift system guarantees instant response. Maximum free lift range is tops in industry. New standards of easy handling are established by "Pace-Maker" features like these!

Send for Booklet SP-23 showing how industry's most complete line of fork lift trucks will improve your plant operations and lower your production costs.

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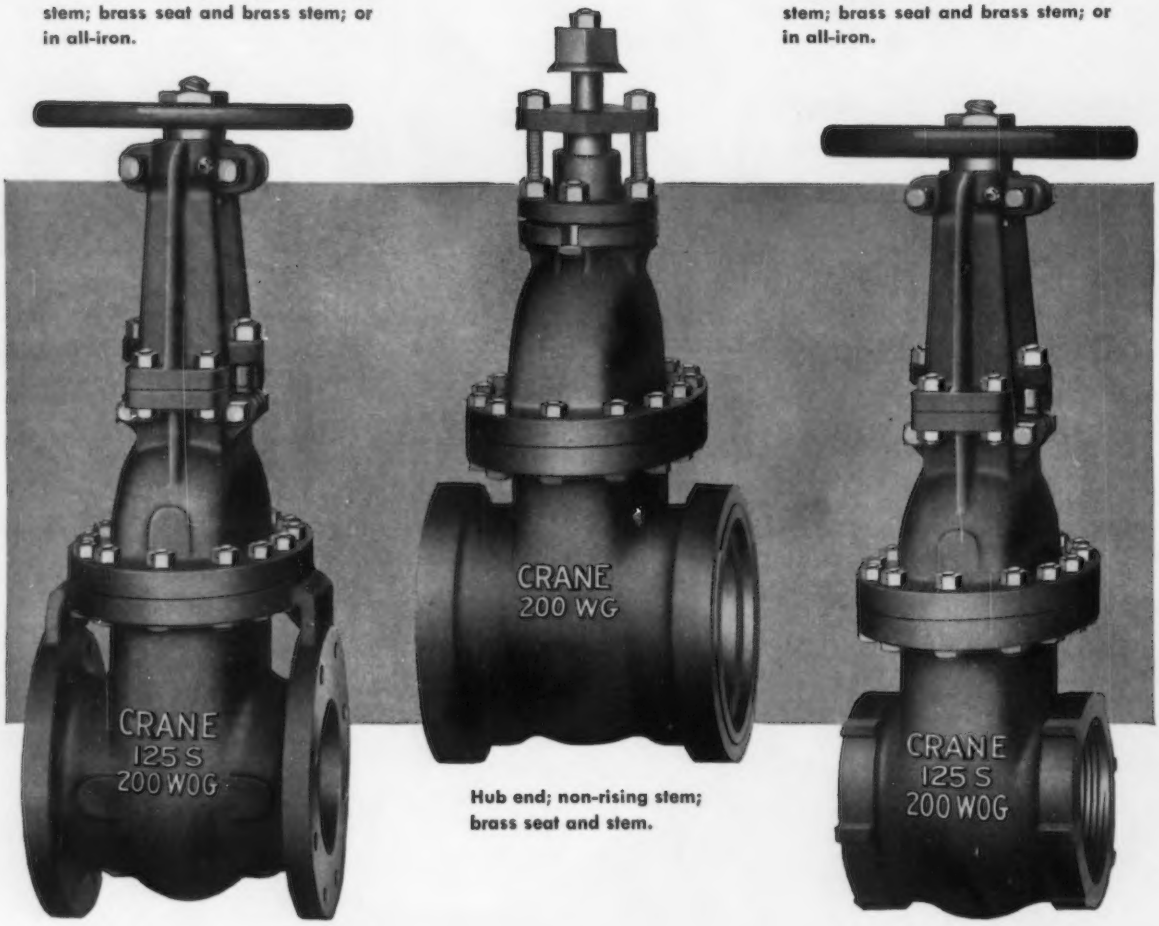
Flanged end; outside screw and yoke. Available with brass seat and steel stem; brass seat and brass stem; or in all-iron.

Screwed end; outside screw and yoke. Available with brass seat and steel stem; brass seat and brass stem; or in all-iron.



Hub end; non-rising stem; brass seat and stem.

Crane Iron Body Gates–Versatile Valves for Pulp and Paper Industry Services

Look to Crane for better performing 125-pound iron body wedge gate valves. Improved design gives them greater strength and important operational advantages. As a result, these valves offer dependable performance on a wide variety of services . . . easy maintenance . . . long life.

Among the advantages of Crane iron body wedge gates are:

- *Oval body and bonnet*, with extra metal where needed most.
- *No bonnet joint leakage*—More bonnet bolts on closer centers insure uniform bolt load distribution on bonnet joint and gasket.
- *Long disc guides* seat discs properly . . . minimize drag on seating surfaces . . . prolong valve life.
- *Shoulder-type seat rings* prevent rings from loosening in service.
- *Two-piece ball-type gland* prevents binding on stem even when gland bolt nuts are pulled up unevenly.
- *Exceptionally deep stuffing box* can easily be repacked under pressure when valves are wide open.
- *Available in 19 sizes*—2 inches to 48 inches—all-iron or brass trimmed. In addition, Crane makes companion valves in globe, angle, check, quick-opening and Underwriters' patterns.

For complete descriptions of Crane iron body gate valves, consult your Crane Representative, or write to Crane Co. at the address shown below.

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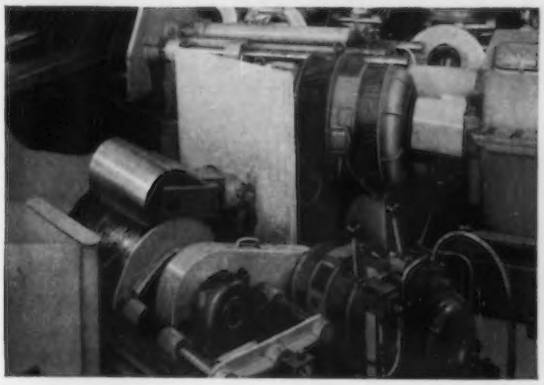
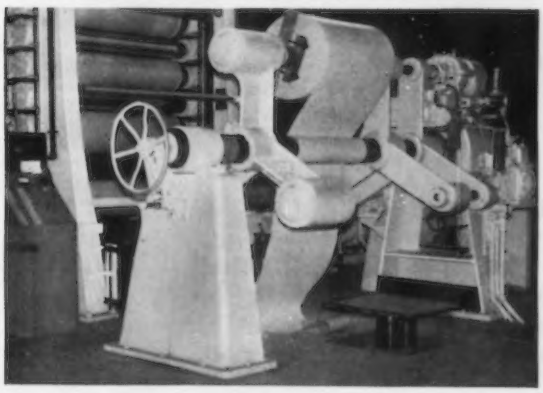


Metal slitter powered by Dynamatic Drives. Adjustable speed liquid cooled coupling used as main drive; Ajusto-Spede® Drives, with constant tension control, wind up the metal strips.



Completely Dynamatic driven paper super-calender. Adjustable speed liquid cooled couplings with Eddy-Current brakes drive the calender rolls and center rewinder. Dynamatic liquid cooled brake provides center unwind hold-back. Co-ordinated controls provide for wide-range adjustment of speed and tension.

Dynamatic Eddy-Current Drives with tension controls are used extensively in the fields of paper, rubber, textiles, ferrous and non-ferrous metals, plastics, and printing.

Combined with associated controls, Dynamatic Eddy-Current Drives provide automatic constant tension as the roll diameter changes on center rewinds and unwinds. Constant tension is maintained over a wide range of material delivery speeds without the use of dancer or follower rolls. Controls may be adjusted for tapered tension to increase or decrease tension automatically as the roll changes diameter.

Multi-range tension or tension adjustment over a wide range is easily accomplished at the operator's station to accommodate materials of various thicknesses or widths. Control modifications are available to provide for inertia compensation and other individual requirements. Dynamatic engineers are available for consultation on your problems.

Bulletins giving detailed information on Dynamatic Tension Control will be sent free at your request.

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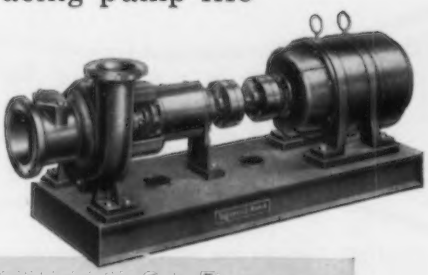
What's your stock pumping problem?

- ☐ Clogging due to high consistencies
- ☐ Vapor-binding due to entrained air
- ☐ Losing prime
- ☐ Corrosion or abrasion reducing pump life



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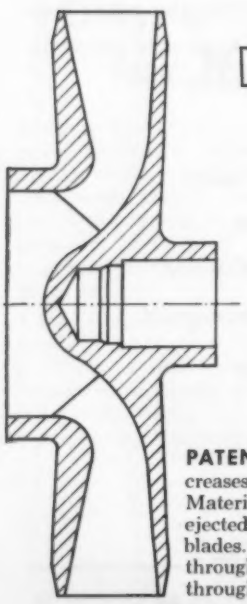
The I-R Ingersoll-Rand All-Purpose stock pump

☐ **CLOGGING?** With its patented *diverging* impeller (see illustration), the I-R All-Purpose pump efficiently handles stock at consistencies as high as 10 percent! This means increased stock chest capacities, reduced bleaching costs, savings in mill water.

☐ **VAPOR BINDING?** Foamy solutions containing large amounts of entrained air or gas can be pumped continuously...with the exclusive diverging impeller.

☐ **LOSING PRIME?** Treated, sized or foamy stock can be pumped without air binding or losing prime as long as flow is maintained to the pump. Stock chests can be completely emptied and the suction piping exposed to air without losing prime.

☐ **CORROSION or ABRASION?** Lower internal velocities with gradual changes in cross-sectional area results in longer service life when pumping abrasive or corrosive liquids. Available in a wide variety of materials for most liquids.



PATENTED DIVERGING IMPELLER increases in width from center to periphery. Material cannot enter fast enough to replace ejected material, and vacuum forms between blades. Entrained air can't bind as it passes through the vacuum. Solids and slurries go through without abrupt acceleration.

As an added feature on the Ingersoll-Rand All-Purpose stock pump, the patented diverging impeller is *interchangeable* with the conventional type impeller. You can switch this pump from normal to heaviest stock service *simply by switching impellers and casing rings.* Ask your local I-R representative for full details on the All-Purpose stock pump; there's nothing like it on the market!

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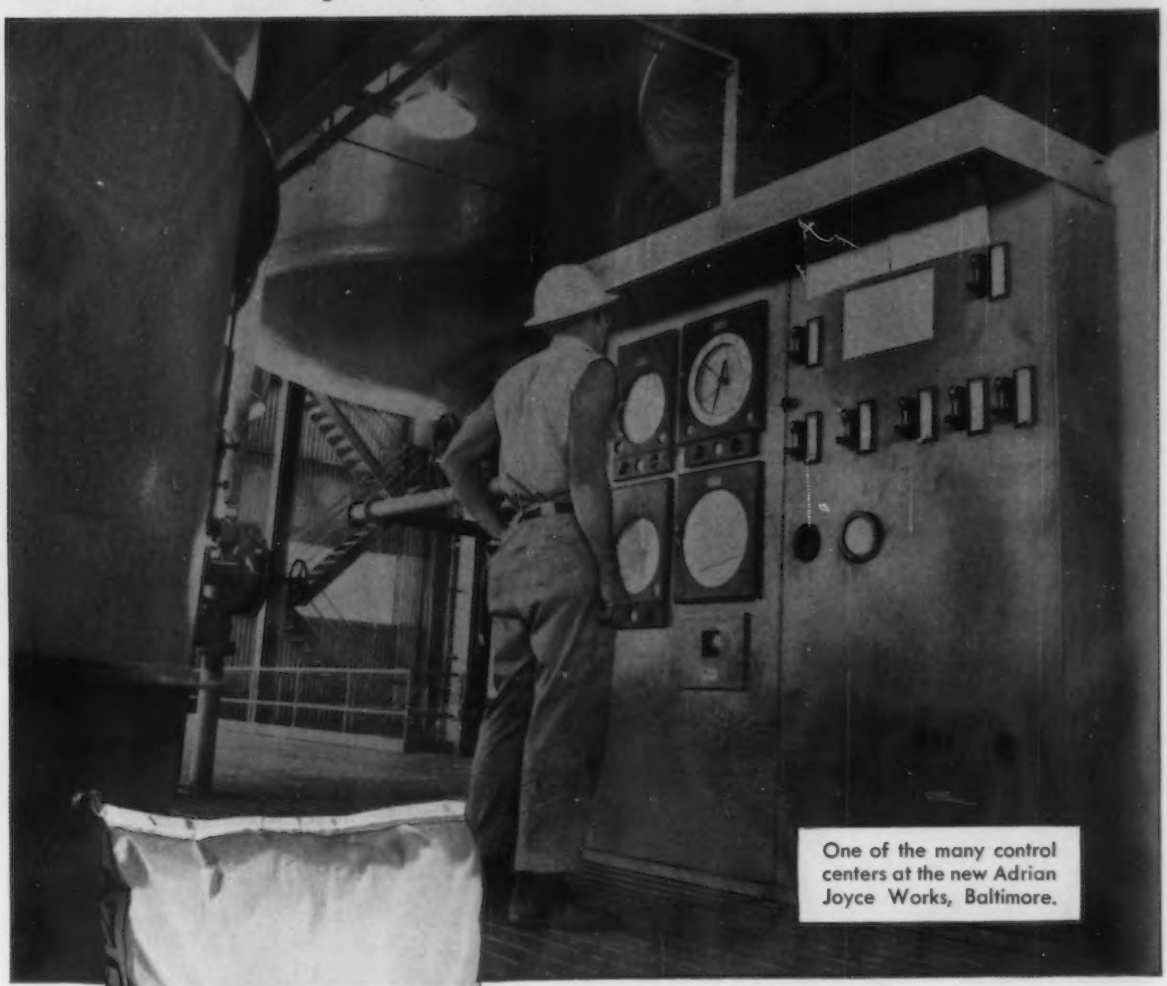

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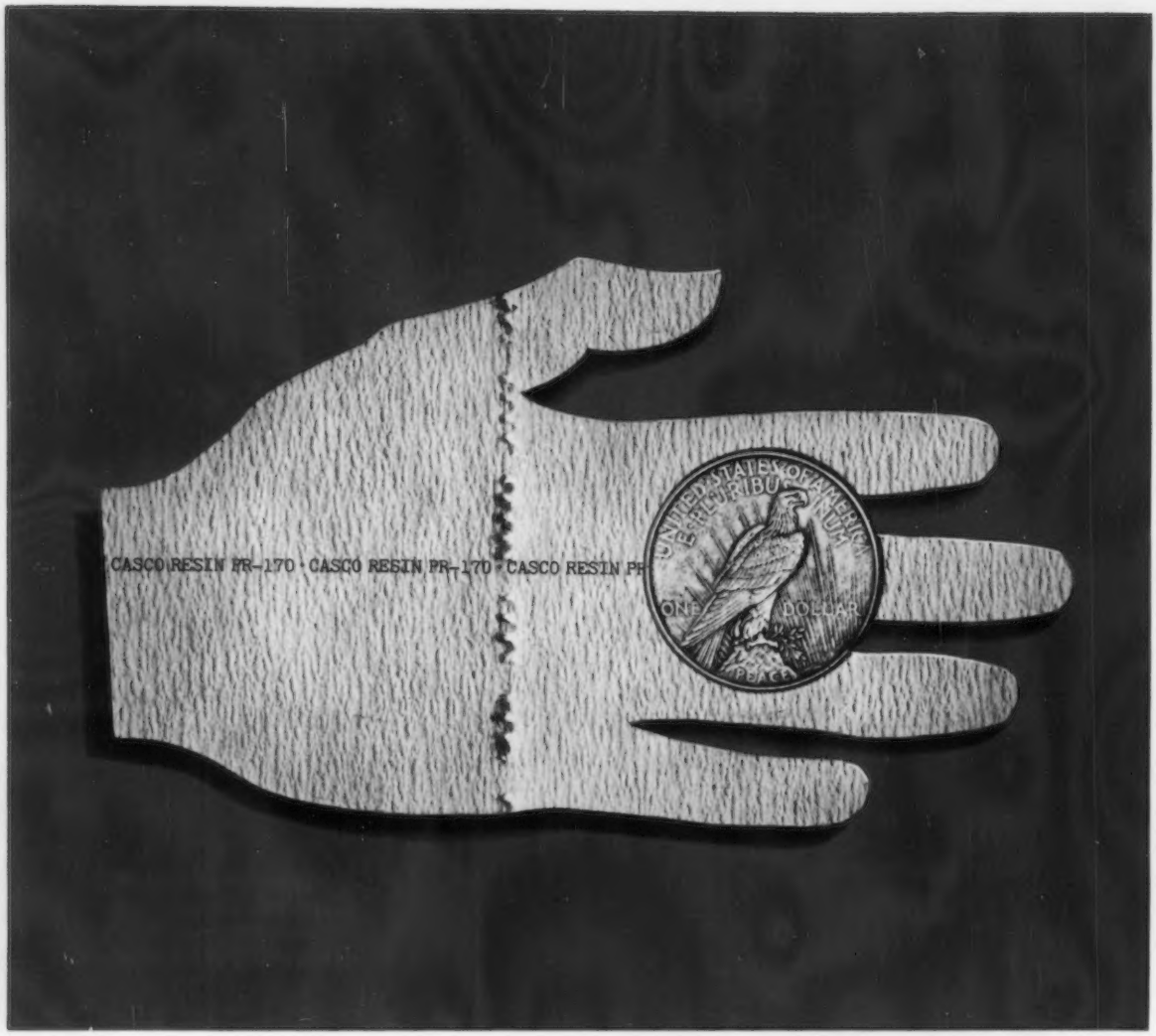


Borden's Wet Strength Resin Saves You Money!

Casco-Resin PR-170 is Borden's cationic-type urea formaldehyde resin for superior wet strength. Paper manufacturers throughout the country are finding that, properly used, PR-170 yields higher wet strength than competing resins and results in a more absorbent paper. And because of its improved compatibility with other paper chemicals, it is effective on a greater variety of pulps.

Exhaustive laboratory tests plus years of paper mill experience with many customers prove that Borden's PR-170 gives improved wet-dry tensile ratios, scuff resistance, wax pick, wet tear and dry folding endurance. What's more, it imparts a minimum of brittleness to the paper and allows for easy broke recovery.

Casco-Resin PR-170 is another result of Borden's continuous research program designed to help you increase the quality of your paper products and reduce your production costs. Delivery is made in the quantity you need, when you need it from strategically located shipping points throughout the country.

Well-trained technical representatives are ready to assist you in applying Casco-Resin PR-170 to your process immediately. For complete technical information, prices and samples, write The Borden Chemical Company, A Division of The Borden Company, Resins and Chemicals Dept. PT-28, 350 Madison Avenue, New York 17, N. Y.

IF IT'S A *Borden* *Chemical* IT'S GOT TO BE GOOD!

Mills Ran at 85%

Paper and paperboard mills both ran at about 85% of capacity in January. Rates for this month are always penalized by the New Year's holiday. This year in numerous cases the New Year's shut-down was extended over the week-end.

Pulp Picture for Year

Pulp production in this country last year was off 2% compared with 1956, according to a report issued by the U. S. Pulp Producers Assn. Other highlights of the report are: Domestic shipments off 7%; Export shipments up 11%. Production of dissolving and special alpha, semi-bleached kraft and semi-chemical pulps all showed increases while other grades accounted for the total 2% drop. Leaders in exports were: dissolving and special alpha, bleached sulphite and bleached and unbleached kraft. Leading importers of our pulp were: United Kingdom (far ahead), Japan, Germany and France.

Business Forms Had Good Year

Sales of the business forms industry in 1957 are expected, when fully tabulated, to total the dollar volume for 1956 which reached $308,000,000, according to the Business Forms Institute.

Set-up Figures for 1957

Cumulative totals of monthly sales and orders reported for the calendar year 1957 by the National Paper Box Manufacturers Assn. indicate set-up box sales were eight-tenths of one per cent below 1956; orders were 1½% below 1956 figures. Sales during December 1957 were three-tenths of one per cent greater than 1956. December orders fluctuated much more widely than sales compared with 1956 and were off 1.5% from 1956 totals.

B. C. Strike Over Nobody Won

The 83-day strike at the B. C. mills was concluded as we go to press. *Nobody won.* The unions report they paid out (lost) $66,000 a week in strike pay for 12 weeks, a total of nearly $800,000. The companies lost production to a value in excess of $30,000,000. Each striker lost an average of about $900 in wages and gained a 2% increase in pay or about $1.50 per week. See page 27 for details of settlement. The pulp and paper industry of North America as a whole may have gained, if the unions have learned to be more moderate in their demands.

Waste Paper Off in Chicago

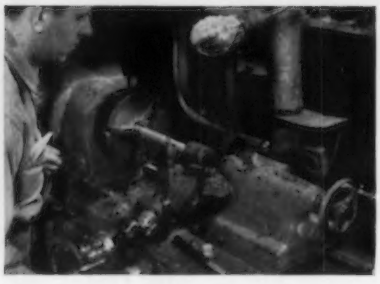
A number of downward revisions have been made in waste paper prices in Chicago for the month of February.

PVC stops corrosion

(POLYVINYL CHLORIDE)

Ryertex-Omicron PVC is an exceptionally versatile industrial plastic with outstanding resistance to 281 corrosive solutions and gases. Its light weight (only 1/6 that of steel) and its great strength are but two of its money-saving advantages. It is nontoxic, noncombustible, nonmagnetic and nonsparking. It is immune to weather, rotting and aging.

PVC comes in the forms you need



You can choose PVC pipe in sizes from ½" through 14". Valves, flanges and fittings are precision-made by injection molding. Bars and sheets are fully extruded, not laminated.

The techniques of fabricating PVC are similar to those for metal. PVC can be cut, drilled, formed, bent, welded, threaded and machined . . . is easy to assemble and install.

A new way to cut costs

Application possibilities are virtually endless. New uses for PVC are being discovered nearly every day. A Ryerson plastics specialist will be glad to help you find out where you can cut costs with this remarkably efficient material. Phone or write your nearest Ryerson plant—now! Send the coupon for our PVC booklet.

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Company_____

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INDUSTRIAL PLASTICS AND BEARINGS DIVISION

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Knowlton Brothers Celebrate 150th Anniversary

Mrs. H. M. Pirnie (nee Knowlton) prepares to cut big birthday cake honoring Knowlton Brothers, Watertown, N. Y., papermaking concern, 150th anniversary. David C. Knowlton, right, is president of the company.

British Columbia Strike Over

The strike against the nine principal pulp and paper mills in British Columbia ended on February 5 after the plants has been closed for 83 days. The strike began after protracted negotiations which were concluded when the employers accepted a conciliation board recommendation of a 7½ per cent wage increase with some wage adjustments and the unions rejected this offer. They insisted on a 12 per cent general increase, more liberal adjustments and expanded vacation provisions and went on strike.

The new contract agreed to after the men had been out since November 14, includes a 9½ per cent general increase, three weeks vacation after ten years service effective now and three weeks after five years effective in 1959.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending January 25, 1958, was 87.8 per cent compared with 89.1 per cent revised for the preceding week. The ratio was 97.9 per cent for the corresponding week a year ago.

The paperboard production ratio for the week ending January 25, 1958, was 87 per cent compared with 90 per cent for the preceding week and 96 per cent for the corresponding week last year.

(Detailed statistics on page 34.)

New Union Election at Chillicothe Paper Co.

An election held at Chillicothe Paper Co. recently resulted in an almost exact duplication of results shown by the election held last year when employees of the Chillicothe Paper Co. voted against the United Papermakers and Paperworkers Union, A.F.L.-C.I.O.

Last week's election was held immediately after the Labor Relations Board declared the 1957 election invalid. Company spokesmen said this week that the current election showed 169 employees voting against the union with 140 employees for the union. Last year's election results were 169-147.

New TAPPI Chairman

At the time of creating the TAPPI Administrative Committee it was decided to appoint on a rotating basis a chairman well acquainted with the industry and particularly with the operations of TAPPI. Vance P. Edwardes has served as the first chairman.

TAPPI President Dr. Ward Harrison has announced that effective February 1 Dr. Allen Abrams, consultant in the paper industry, has accepted the Chairmanship of the Administrative Committee of TAPPI for the year 1958. Dr. Abrams is a former National TAPPI President and has been an active member of the association for many years. Prior to his recent retirement he was vice president in charge of research for the Marathon Corp.

Allen Abrams

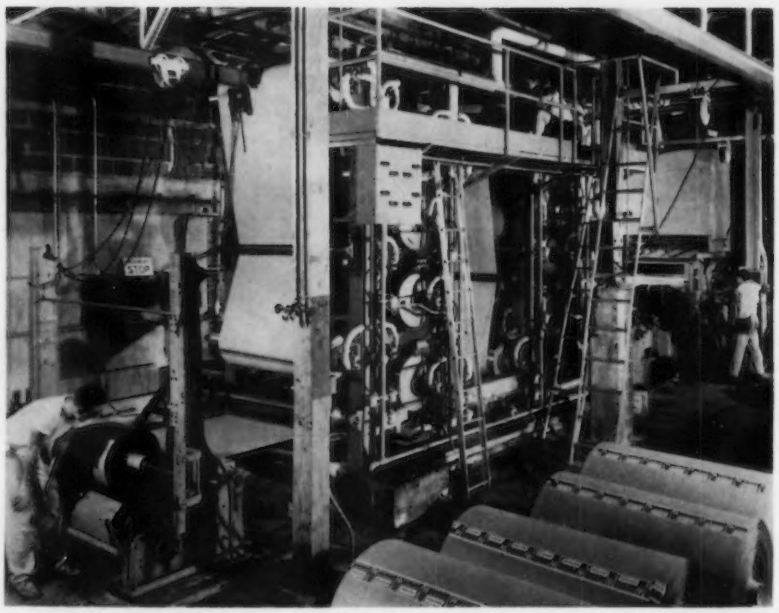
West Virginia Brings Revolutionary Stretchable Paper to Market

A revolutionary stretchable paper of unusual strength has been developed by West Virginia Pulp and Paper Co. under a patent held by Cluett, Peabody & Co. Inc. and now is being produced commercially. The new paper is being manufactured on a new $25,000,000 paper machine at the company's Charleston, S. C., mill, capable of producing up to 225 tons per day.

Varying degrees of controlled strength imparted by mechanical means give the new paper unprecedented toughness, which is particularly significant in packaging applications. Smooth in surface, the extensible paper resembles a regular sheet of paper, except for its flexibility and toughness.

Trial runs of the paper have been carried out for the past month on the Charleston mill machine, which is equipped with an extensible processing unit. These trials climaxed three years of intensive experimental work by a task force of Westvaco technicians to commercially develop a patent by Cluett, Peabody. Sanford Cluett, inventive genius of Cluett, Peabody and the man responsible for the shrinkage process behind the Sanforized trade mark, is the man who conceived the basic idea for extensible paper of this type.

Licensing rights will be extended to other paper manufacturers through a new company, Clupak Inc., organized jointly by West Virginia and Cluett, Peabody. Paper made by the new process is being marketed under the trade mark of Clupak, owned by Clupak Inc.



Pilot machine at Charleston, S. C. was used to produce stretchable paper prior to commercial production.

Multi-wall Sacks

The first Clupak papers being sold commercially are kraft grades to be used primarily in the manufacture of multi-wall sacks; specialty bags, including supermarket checkout bags; wrappers, and other kraft packaging products, and in numerous industrial applications where unusual strength is required. These grades will be marketed as Kraftsman Clupak paper.

Semi-commercial production of the stretchable paper on a 60-inch pilot machine at the Charleston mill has enabled the company to carry out comprehensive test evaluations. These tests have been underway during the past two years. For the past six months, tonnage from the pilot machine has been sold in small lots to converters who have experimentally manufactured a number of paper products for evaluation purposes.

Extensive tests under laboratory conditions show that supermarket checkout bags made of Kraftsman Clupak paper can withstand 20 or more suspension drops with an average checkout load of groceries, compared with bag failure after one or two drops in the instance of conventional kraft paper. Performance test data on multi-wall sacks indicate that Clupak products can withstand two to three times more punishment than comparable sacks made of regular kraft papers.

Pricing

Westvaco officials said that the Kraftsman Clupak paper grades are priced slightly higher than the current market price for regular kraft grades. It was pointed out that the premium price is offset by the better performance of products made from the paper, resulting in overall economies for the converter and shipper. The stretchable paper is being offered in multi-wall sack, asphalting, waxing and standard converting grades. The paper will be made in all normal basis weights, ranging from 30 to 70 pounds.

Although production at the outset will be limited to kraft papers, product development work being carried out by the paper company indicates a wide range of use for Clupak papers in the future.

More Production

West Virginia officials state that an increasing amount of the new stretchable paper will be available in the coming months as more of the company's machines are equipped with an extensible unit and as other paper producers are licensed to manufacture the new product. Installation of extensible units have already been planned for a second large paper machine at the company's Charleston mill and for a small specialty machine producing white papers at the company's Luke, Md., mill.

Westvaco "Firsts"

"Firsts" are not new to the 70-year-old West Virginia Pulp and Paper Co., which has brought to the market the first smooth-surfaced stretchable paper in the history of papermaking.

The first company to establish a commercially successful sulphite pulp mill in this country back in 1888, West Virginia's progress ever since has been keyed to this pioneering spirit.

It has sparked the growth of the company's annual capacity from a few thousand to more than a million tons of paper and paperboard.

Westvaco was the first to buy pine lands in the Carolinas when pines were considered weed trees.

It was among the first to develop pine wood and kraft pulp and to broaden its markets, once confined to cultural papers, to include utilitarian kraft markets.

It was among the first to develop hardwood pulping processes and the first to introduce a linerboard with a surface made from hardwood pulps.

It was the first and is today the only commercial producer of activated carbon in the paper industry, being a leader in the development of products of value from the wastes of paper manufacture.

It was the first to establish and maintain its own experimental forest on what is now a 20,000-acre tree farm laboratory and forest research center.

Statement of G. E. Amerman, President, Clupak Inc.

I'll try and outline for you why this new corporation, Clupak Inc., was organized and what we see as our principal activities.

First: We will be organized to license paper manufacturers in the U. S. and Canada, and throughout the world, to use our extensible paper process under patents owned by Clupak Inc.—and these licensees will be permitted and encouraged to use the trademark "Clupak" on all of their shipments. Of course, the license will carry the "favored nation clause," which means that each and every licensee will be treated alike and will all have the same royalty rate as all licensees within a country.

In that regard, you should know that West Virginia Pulp and Paper Co. will be a licensee—the same as everyone else and will have the same royalty rate as any other licensee in this country.

Second: We will service licensee, by furnishing technical assistance, and will pass along to *all* licensees any product improvements and new developments which might come to our attention, either through our own research or from other licensees—so that *all* licensees will benefit from *all* improvements.

Third: We will aggressively promote, through advertising, the trademark "Clupak," both here and in foreign countries. Our initial target will be the paper industry, but later we hope that new areas of demand will have opened up for extensible paper, so that we can promote "Clupak" to the ultimate consumer—the same as has been done with the "Sanforized" trademark.

Fourth: We will conduct research to find other uses for extensible paper (other than we now know) and we will conduct further development work on present known uses for extensible paper.

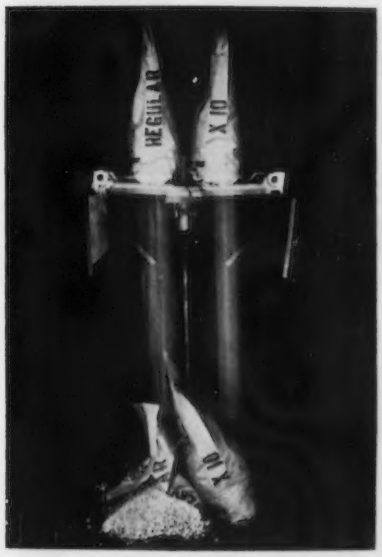
Fifth: Inspection of licensees' products will be made, through performance tests, designed to maintain the standard of quality in goods, using the trademark "Clupak"—and in this way we will protect the integrity of the trademark.

It is our aim to have our own staff of technicians and engineers so as to assist licensees with such things as: help in design of machinery—assist at installation of machinery—and help with any production problems that might arise on "Clupak" paper.

With regard to licensing—it will be our intention to follow the principle of establishing royalties, so as to make it possible for the entire industry to participate and use the process on the other hand, royalties must be sufficient to support an organization that will continue to conduct research—(for the good of the paper industry)—sufficient to aggressively promote the trademark — "Clupak" — and to carry forward the other activities I outlined to you.

We are not in a position to license immediately, because of the many improvements that are now taking place —consequently the machine design has not been "frozen" and certainly it would not be wise for any licensee to install a machine now, only to have it obsolete in a few months.

The way we see it now—we should have a "frozen" design by late spring or early summer and also by that time our staff should be built up to the point that we could start our licensing program and be ready to offer the services I have spoken about.



Drop test on multi-wall sacks—ordinary kraft left, stretchable paper right.

Drop test on grocery bags—ordinary kraft left, stretchable paper right.

Whiting Paper Negotiating Its Future

Whiting Paper Co. has admitted that negotiations are under way with another company. President William Whiting of the 94 year old Holyoke, Mass. paper company declined to indicate if the current negotiations were in the direction of merger, sale, or acquisition.

WMU Paper Group Elects Officers

Dwight L. Stocker, president of KVP Co., Parchment, has been re-elected chairman of the advisory committee on paper technology at Western Michigan University for a second one-year term.

Also re-elected were L. D. Nicholson, general manager of the W. C. Hamilton Co., Plainwell, vice chairman, and Dr. A. H. Nadelman, head of the WMU paper technology department, secretary.

New members elected to the committee are John Lean, vice president and general manager, Rex Paper Co., Kalamazoo; Frank Roberts, resident manager, S. W. Warren Co., Muskegon; Bert H. Cooper, vice president, Kalamazoo Paper Co., Kalamazoo; Norman Bardeen, vice president, Lee Paper Co., Vicksburg, and George Johnston Jr., resident manager, Continental Can Co., Three Rivers.

Also re-elected to the committee was William A. Kirkpatrick, vice president, Allied Paper Corp., Kalamazoo.

Allied Buys Osborn Sharon Div.

Allied Paper Corp., Chicago, has exercised its option to purchase Sharon Division of Osborn Paper Co. Inc., of Sunnyvale, Calif.

This is Allied's fourth acquisition in the paper converting field. In July, Allied took options to purchase the Osborn Paper Co., manufacturer of paper school supplies, founded in 1892; Mid West Paper and Envelope Co., producer of envelopes and social stationery since 1918; and Sharon, a wholly-owned subsidiary of Osborn. The Osborn and Mid West options were exercised in September and the companies merged into Osborn-Midwest Paper Corp. Mercury Envelope Co., San Jose, Calif., was purchased in October.

Allied now has tablet, stationery, and envelope activities both in the Midwest and West.

Mead Makes Offer to Acquire Firm

The Mead Corp. has offered to acquire the assets of the Bermingham-Prosser Co., large paper wholesaling firm, through stock exchange, it was announced by Mead officials today.

H. Warren Kamps, president of Mead Papers Inc., a Mead subsidiary located at Dayton, said the acquisition is subject to approval of Bermingham-Prosser stockholders at a meeting to be held later—possibly in February.

EMPLOYEES PRESENT PORTRAIT of Frank A. Juckett, late president of the Sandy Hill Iron and Brass Works, Hudson Falls, N. Y., is shown being presented to Dr. Richard C. Tefft Jr., chairman of the board of directors (left) by Albert Bellos in behalf of the company's employees. More than 400 employees and guests attended a recent dinner, which launched Sandy Hill's year-long celebration of its 100th year manufacturing machinery for the pulp and paper industry.

T. N. Beaupre

British Columbia CPPA Chooses Officers

At the recent annual meeting of the British Columbia Division, Canadian Pulp and Paper Assn., T. N. Beaupre, executive vice president, Columbia Cellulose Co. Ltd., was elected Chairman of the Executive Committee for the calendar year 1958. L. L. G. Bentley, vice president, Canadian Forest Products Ltd., was elected vice chairman.

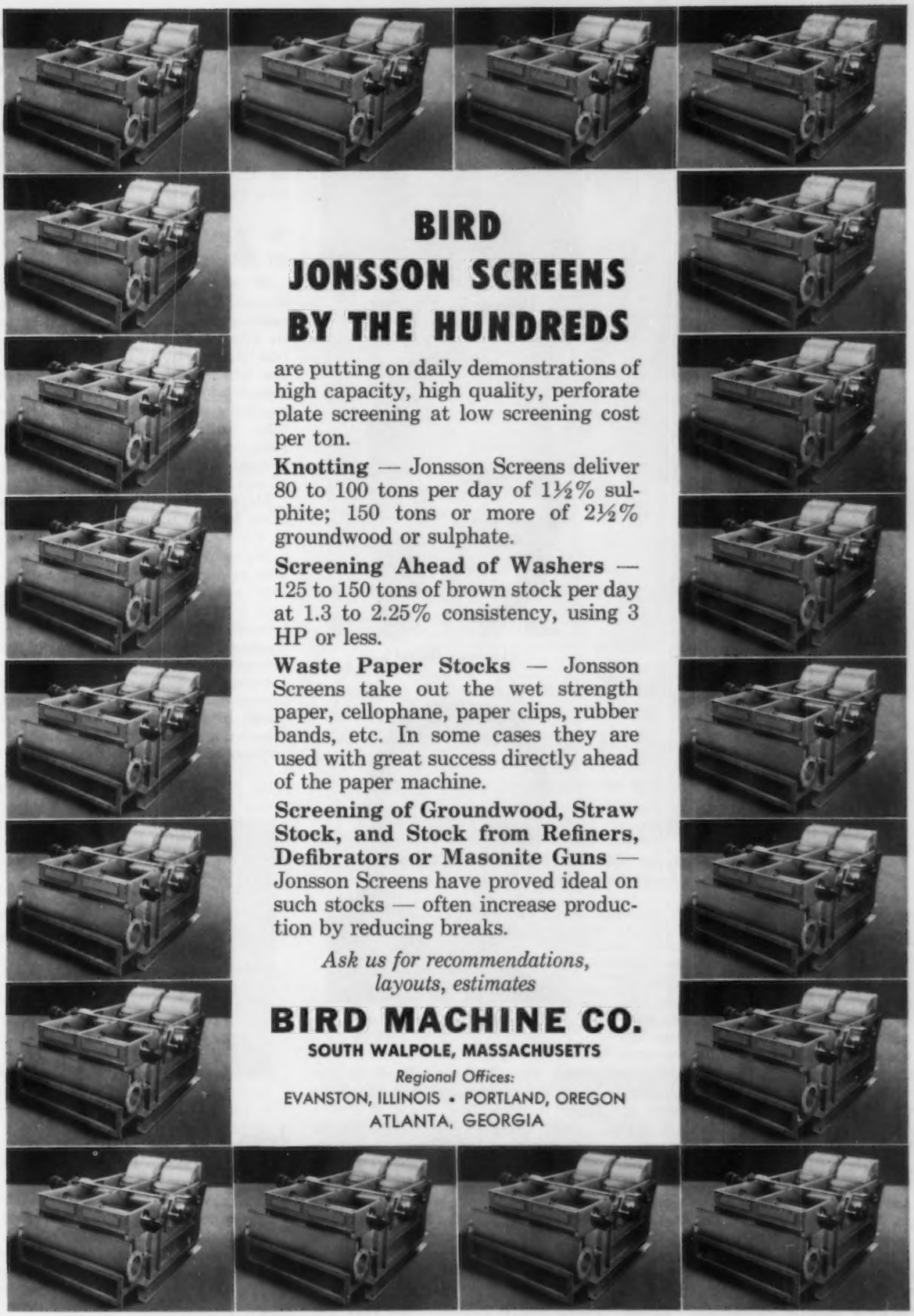
The members of Mr. Beaupre's executive committee are: W. E. Breitenbach, executive vice president, Alaska Pine & Cellulose Ltd.; Ian Barclay, assistant to the executive vice president Columbia Cellulose Co. Ltd.; J. A. Craig, president and managing director, Sidney Roofing & Paper Co. Ltd.; E. M. Herb, president, Westminster Paper Co. Ltd.; M. J. Foley, president, Powell River Co. Ltd.; J. S. Johannson, general manager, association relations, MacMillan & Bloedel Ltd.; C. D. Dickey Jr., president, B. C. Forest Products Ltd.; R. J. Schadt, vice president in charge of manufacture, Elk Falls Co. Ltd.; and R. H. R. Young, executive vice president, Crown Zellerbach Canada Ltd. Leander Manley is Secretary Manager.

Plastics-Paper Conference Set for October

The 13th annual Plastics-Paper Conference of TAPPI will be held at the Sheraton-Kimball Hotel, Springfield, Mass., October 20-22, 1958.

R. W. Reiter, National Starch Products is general chairman of the conference, which is sponsored by the TAPPI Plastics Committee. The technical program chairman for the conference is R. G. Hochschild, Koppers Co., Inc., and local arrangements are being made by W. N. Stickel, Texon, Inc. W. A. Schenck, Riegel Paper Corp., is chairman of the sponsoring committee.

Reservations for sleeping accommodations should be made with the Sheraton-Kimball Hotel, Springfield, Mass.



BIRD JONSSON SCREENS BY THE HUNDREDS

are putting on daily demonstrations of high capacity, high quality, perforate plate screening at low screening cost per ton.

Knotting — Jonsson Screens deliver 80 to 100 tons per day of 1½% sulphite; 150 tons or more of 2½% groundwood or sulphate.

Screening Ahead of Washers — 125 to 150 tons of brown stock per day at 1.3 to 2.25% consistency, using 3 HP or less.

Waste Paper Stocks — Jonsson Screens take out the wet strength paper, cellophane, paper clips, rubber bands, etc. In some cases they are used with great success directly ahead of the paper machine.

Screening of Groundwood, Straw Stock, and Stock from Refiners, Defibrators or Masonite Guns — Jonsson Screens have proved ideal on such stocks — often increase production by reducing breaks.

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PAPER PEOPLE

Herbert C. Church

Eugene E. Rodabaugh

New York and Penn Management Changes

Herbert C. Church has been appointed to the new post of director of process and product development and a general realignment of supervisory responsibilities at the Lock Haven Division of the New York & Pennsylvania Co.

Prior to his new appointment, Mr. Church was general superintendent of the Lock Haven Division. Before that he was technical assistant to the vice president. He joined New York and Penn in 1946 and was formerly with American Coating Mills, Champion Paper & Fibre Co. and Bloomer Bros. Co.

Assisting Mr. Church will be Eugene E. Rodabaugh, manager of research laboratories. Mr. Rodabaugh, with New York and Penn since 1947, was formerly pulping technologist. Before joining New York and Penn, he was with Crossett Industries and Champion Paper & Fibre Co.

Thomas G. Williams

Herman Uebel

Charles Flaig

Other changes brought about by the appointment of Mr. Church to his new position are as follows:

Thomas G. Williams, superintendent of the Lock Haven mill, moves up to take over Mr. Church's former post as general superintendent of the Lock Haven Division. Replacing Mr. Williams is Herman Uebel. Mr. Uebel, formerly paper mill superintendent of the Lock Haven Mill, is a veteran New York and Penn papermaker. He has been with the firm since 1919 when he joined it as an extra man in the machine room at Lock Haven.

Charles Flaig, paper mill general foreman, has been named to take over Mr. Uebel's former post and H. D. Floruss, paper tour foreman, moves up to fill the vacancy created by Flaig's new appointment.

St. Regis Appoints Head of New District

St. Regis Paper Co. has appointed Richard C. Myles sales manager of the newly-created southeastern district of its Printing Paper Division. This district includes Georgia, South Carolina, and Chattanooga, Tenn., which were covered formerly by the Division's Louisville office, and Maryland, Delaware, the District of Columbia, Virginia, and North Carolina, which were covered formerly by the New York office.

Mr. Myles will make his headquarters at the Medical Building, in Washington, D. C.

Walter J. Brown has been named sales manager of the new Central District, which combines the areas covered formerly by the Cleveland and Louisville offices of the Division. Stephen Casey remains in charge of the Louisville office of the district.

Walter Kinsley, formerly assistant to Edward G. Murray, vice president in charge of sales of the Printing Paper Division, has been named assistant sales manager of the Eastern District.

Charles G. Brough

Joins Champion Intl.

Charles Gordon Brough, who for eight years was connected with the American Viscose Corp., Front Royal, Va., as a project and crafts supervisor, has recently joined Champion-International Co., Lawrence, Mass., manufacturers of high quality coated papers for the fine printing industry, as a project engineer.

James R. Arthur

Named Port Huron Technical Director

James R. Arthur has been appointed technical director of Port Huron Sulphite and Paper Co.

He has been with Port Huron since 1945 and prior to that was chief chemist of the Maxwell Paper Co., Franklin, Ohio, a division of Howard Paper Mills.

Gilligan Joins St. Regis

Gerald S. Gilligan has joined St. Regis Paper Co. as market analyst and economist. He was formerly senior economist and head of Forest Products Economics at Stanford Research Institute with headquarters at Portland, Ore.

Mr. Gilligan was project leader on the Stanford Research Institute report prepared for the Weyerhaeuser Timber Co., titled: "America's Demand for Wood 1929-1975." He has also conducted economic studies for forest products firms in the United States and Canada.

Scott Announces Engineer Promotions

Scott Paper Co. has announced promotions affecting the company's staff engineering and development division. David R. Wadleigh has been named director of the division, succeeding A. J. Karpinski, who has assumed the post of assistant general manager for production at Scott's Mobile, Ala. plant.

Mr. Wadleigh, who joined Scott in 1947, was an active participant in the expansion of the company's Everett, Wash. mill. He has most recently served as assistant to the director of the division he now heads.

Ralph G. Young, formerly assistant plant manager for production at Mobile, has been named special assistant to the director of staff engineering and development.

NEW!... Today's Most Accurate Lateral Alignment Controller!

"MAGIC TOUCH" Control
Unique *sensing* finger gently and continuously contacts one selvage . . . instantly triggers corrective control action when sheet tends to move out of line. Also available with jet air sensing element for use on materials that cannot be touched.

Mount Hope FLOATING ROLL GUIDE

- **Corrects with Split-Second Precision** any tendency of moving cloth, paper, plastic film or sheet to run out of alignment.
- **Automatically Guides without Nipping** through "swing action" of *separated* rolls . . . keeps material at right angles to rolls.
- **Reduces Seconds** caused by marred selvages, displaced warp threads, damaged nap, or distorted edges.
- **Builds Square-Edged Rolls** that provide closer register in printing, less trim waste, smoother all-around processing.

Now you can be sure of *smooth*, automatic control of lateral alignment within thousandths of an inch! The new Mount Hope Floating Roll Guide provides the most positive guiding action that you can apply to textiles, paper, foil, and plastic film or sheet. This compact, self-contained unit installs easily wherever needed on continuous or batch-type machines. Guides gently without nipping, jerking, pulling or stretching. Provides clean, oil-free mechanical operation. Best way to keep *your* production "in line." For complete details, mail coupons for Free Illustrated Bulletin.

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William J. Alford

C. L. Von Egloffstein

Top Changes at Continental Paper

William J. Alford, president since 1940 of Continental Paper Co., parent company in the Alford Packaging Group, has been elected chairman of the board of directors and treasurer, it was announced today. He continues as a member of the executive committee.

C. L. Von Egloffstein, a management consultant in the paper industry and a director and member of the executive committee of the company since 1956, has been elected president. He continues as a director and member of the executive committee.

Mr. Alford, who since 1945 has been chairman of the board of Thames Board Mills Ltd., London, an affiliated company, continues in that post.

The Alford Packaging Group includes, in addition to Continental Paper Co., Alford Cartons, Industrial Packaging Co., Inc., and Ridgewood Machine Corp. Group members produce precision paperboard, cartons, and specialized package machinery, and provide development services in package design and construction, and packaging line production methods.

Other officers of Continental Paper Co. elected at the same time were A. B. Huyssoon, vice president and general manager of the paperboard division; W. J. Alford III, vice president and general manager of the carton division; J. C. Alford, vice president and manufacturing manager of Continental Paper Co.; G. E. Alford, vice president and manufacturing manager of the carton divisions; F. C. Williams, vice president and general sales manager of the carton divisions. J. G. Daly was reelected controller of the company.

Hammermill Appointment

Richard A. Reeves has been named district sales manager of Hammermill Paper Co.'s central sales territory. He succeeds Harold B. Wilson, now sales promotion manager.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1958	Dec. 28, 1957 49.4	Jan. 4, 1958 75.5	Jan. 11, 1958 88.7	Jan. 18, 1958 89.1r	Jan. 25, 1958 87.8
1957	Dec. 29, 1956 66.7	Jan. 5, 1957 85.4	Jan. 12, 1957 96.5	Jan. 19, 1957 97.0	Jan. 26, 1957 97.9

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	—	—	—	—	—	—	—	—	—	—	—	—	—
1957	94.2	97.0	97.1	94.0	94.6	93.3	75.6	90.7	86.0	93.0	89.8‡	81.4‡	90.9

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1951	1952	1953	1954	1955	1956	1957	1958
Year to Date	99.5	97.6	95.0	94.2	95.0	97.9	94.0	
Year Average	98.0	88.6	92.3	91.6	94.9	97.9	90.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Ass'n.

COMPARATIVE WEEKLY SUMMARIES

1958	Dec. 28, 1957 45	Jan. 4, 1958 51	Jan. 11, 1958 88	Jan. 18, 1958 90	Jan. 25, 1958 87
1957	Dec. 29, 1956 52	Jan. 5, 1957 75	Jan. 12, 1957 97	Jan. 19, 1957 95	Jan. 26, 1957 96

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	—	—	—	—	—	—	—	—	—	—	—	—	—
1957	91	94	94	92	93	91	72	94	91	97	92	79	90

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

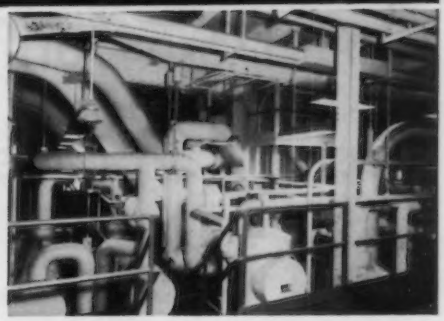
ITEM	THIS WEEK ENDING Jan. 25, 1958 87%	LAST WEEK ENDING Jan. 18, 1958 90%	CUMULATIVE TO DATE Jan. 1 to Jan. 25, 1958 85%
	Tons	*Tons*	*Tons*
Total Production	266,581	281,999	878,260
Liner	84,316	94,025	285,825
Corrugating Material	37,344	41,493	135,488
Chip & Filler Board	4,355	4,023	12,891
Total Container Board	126,015	139,541	434,204
Folding	56,799	53,056	168,861
Set-Up	11,110	10,616	33,060
Special Food Board	23,887	23,365	75,554
Other	48,770	55,421	166,581
Total Boxboard	140,566	142,458	444,056
Total Orders	*Tons*	*Tons*	
Received	236,717	225,702	
Unfilled End of Week	348,266	377,663	

Allied Creates New Dept. at Kalamazoo

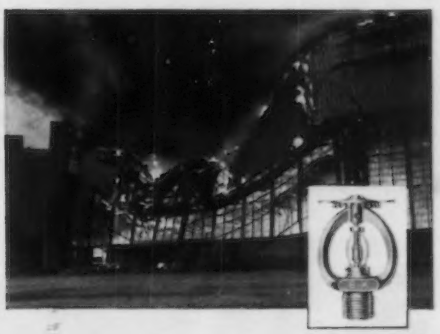
Allied Paper Corp. has announced the creation of a sales administration department at its Kalamazoo, Mich. plant to supervise such administrative functions as cost requests, complaints and sample control. The new department will be directed by Michael Maremont, formerly of Allied's New York City office.

Mr. Maremont's New York duties will be filled by Ramsay Taubert, a veteran of three years with the Standard Paper Manufacturing Co.

BLAW-KNOX has what it takes—to provide these products and services



Heater piping system in this modern generating station is typical of many high temperature, high pressure systems prefabricated and erected by Blaw-Knox. Experienced piping engineers, modern shop facilities and a new Blaw-Knox digital computer method for fast, accurate calculation of piping stresses are available to you. Let us know your requirements and we'll provide the service you need. For more information, write for Bulletin No. 2443—"Piping for Industry."



Out of every 100 firms who lose their records in a fire, 43 never reopen for business. Be safe. Let a Blaw-Knox fire-protection engineer study your needs—and explain how you can pay for the system on our lease or deferred payment plan. To get more information send for Bulletin No. 2426—"Fire Can Destroy Your Business."

Blaw-Knox trapeze functional spring hanger installed in first large atomic generating station. Vital power piping system for the atomic generating unit in the Duquesne Light Company's Shippingport Station is supported by Blaw-Knox custom-engineered hangers.

Blaw-Knox makes a complete line of standard and custom-engineered pipe hangers, supports, and vibration eliminators. Each is a complete packaged unit, designed for a specific purpose and constructed to comply with the "code for pressure piping." Available in types and sizes to meet varying conditions, ready to install.

Blaw-Knox engineers, who have solved many difficult hanger and piping vibration problems, are always available to both design and make recommendations for your hanger requirements. For further information, write for Catalog No. 54.

BLAW-KNOX

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Complete facilities for prefabrication and erection of piping systems for all pressures and temperatures ... complete line of standard and custom-engineered pipe hangers, supports and vibration eliminators ... complete line of automatic sprinkler systems for standard and special hazards

One Day Conference at WMU Paper Technology Dept. Was Big Success

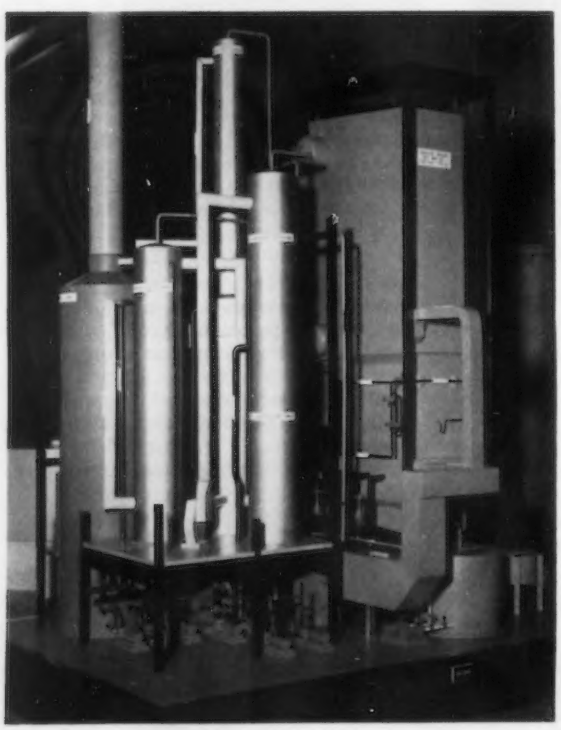
The second annual pulp and paper conference at Western Michigan University was devoted to studying the various pulping methods, their problems and economics.

John C. W. Evans
Editor, Paper Trade Journal

A survey of pulping methods with emphasis on the newer processes was the subject of a one day conference held in Kalamazoo by the pulp and paper department of Western Michigan University on January 23. Approximately 100 industry representatives were present and took part in the discussion.

Pulping Methods

Raymond Janes, assistant professor of paper technology, Western Michigan University, opened the program with a paper discussing all the pulping methods in commercial use on wood. (Mr. Janes' paper will be published in an early issue of *Paper Trade Journal*).



Model of Mead semichemical recovery process displayed at the WMU conference by Babcock & Wilcox.

Following Mr. Janes' paper a four-member panel discussed various developments in pulp technology. Dr. Donald Jackson, research director, Hammermill Paper Co., made the following points: The need to straighten out pulping nomenclature in the semichemical and chemical-mechanical pulping fields. Need for further intensive work for research on disposal or utilization of semichemical pulp mill waste. He particularly stressed that the disposal of NSSC bleaching waste has not received enough attention. Finally, Dr. Jackson pointed out little research had been done on special techniques of stock preparation to bring out the unique properties of fully bleached NSSC pulp.

G. H. Chidester, U. S. Forest Products Laboratory, Madison, Wis., reviewed recent developments in the field of cold caustic pulping, a process which was originally developed by Mr. Chidester and his co-workers. R. E. Shook, Sprout Waldron & Co. Inc., described the new type of continuous pulper developed by his company, the first of which recently went into operation at Sonoco Products Co. Knut Dahl, Kamyr Inc., discussed the advantages of continuous pulping in detail and referred briefly to his company's vertical continuous digester. Mr. Dahl stressed that his company is concerned with producing new equipment not new processes.

Garland Luncheon Speaker

Dr. Hereford Garland, director of the forest products research division, Michi-

WMU Professor R. A. Diehm

gan College of Mining and Technology, was the guest speaker at the luncheon. He said that "every economic forecast indicates the pulp and paper industry is faced with increasing demands for products, many of which can be well made of Michigan wood species and can be sold in Michigan's marketing region."

Ample Wood

Far from being depleted, he said, Michigan's forest crop is now in a position to be utilized in such quantities as to make the operation of new pulp mills economically feasible. Using land to its full capacity for the growth of trees is as important as over-cutting, he said.

At the college of Mining and Technology, studies are being made towards utilizing Michigan woods in pulping operations, he said. Exploration has been in such areas as: producing corrugating medium from hardwoods; use of Michigan Upper Peninsula woods for hardboard and insulating board; and aspen in the production of dissolving pulp; milk carton stock with a large proportion of hardwood pulp; and utilization of hemlock sawmill slabs for pulp and recovery of tannin.

Economics of Pulp Manufacture

Dr. R. A. Diehm, professor of paper technology, Western Michigan University, led off the afternoon session with a paper "The Economics of Pulp Manufacture." Dr. Diehm's paper (which will be published in *Paper Trade Journal*) presented comparative costs for production of bleached and unbleached pulps by all the most widely used processes. A three-member panel gave short talks on various pulping subjects at the conclusion of Dr. Diehm's paper. Lee Eberhardt, Bauer Bros., in an unconventional approach, critically surveyed present practices and concepts in pulp and paper design and operation. Mr. Eberhardt has promised to expand his remarks into an article for publication in *Paper Trade Journal*. W. J. Darmstadt, Babcock & Wilcox Co., discussed chemical recovery systems with special emphasis on the Mead recovery system. W. Zimmerman, Black-Clawson Co., talked on recent developments in design and operation of the Pandia Chemi-pulper.

Attend TAPPI-Superintendents Meeting

In the evening those present at the conference attended the 23rd annual get-together of the local Superintendents and TAPPI associations. Principal speaker at the dinner was Morlan Grandbois, market research manager for St. Regis Paper Co.

Mr. Grandbois stressed the need for a new approach to marketing, pointing out that the paper industry must find a way to use up its vast production potential if machines are to be kept operating safely above the break-down point.

"The marketing-management concept," Mr. Grandbois said, "means that management accepts the philosophy that every decision in the operation of a business is made in the light of customer needs. Marketing-management starts with customer need, and ends with the satisfaction of that customer need.

"The marketing-management concept guides our marketing effort in developing, producing and selling products that our customers need—it simply means we get more return from our effort expended and dollars invested. And, of most importance today, it helps keep those companies that practice that concept from becoming marginal—the position in which none of us wants to be, but a position in which some of us will be if we just coast along."

A. H. Nadelman, head of Paper Technology Dept.

WMU Asst. Professor R. S. Janes beside display model of Coosa River Newsprint Co.'s new 150-ton-per-day pulp mill to produce groundwood type pulp from hardwood chips.

Black Widow Continually Measures Brightness of Pulp Flowing in a Pipe

D. Noel Obenshain
Project Leader, Engineering and Design,
Luke Research Laboratory,
West Virginia Pulp and Paper Co., Luke, Maryland

The "Black Widow" is a photoelectric device which measures the reflection, or "brightness", of continuously moving pulp and paper. This report describes the design and application of the Black Widow, and compares its control of the chlorination stage of the bleaching process with the customary chlorine residual control of the process at the Luke, Md. mill of the West Virginia Pulp and Paper Co.

The validity of pulp brightness as an index of degree of bleaching was first investigated in 1952, when a crude photoelectric device was used to determine the degree of pulp brightness change resulting from normal variations in chlorine feed rate, pulp consistency, and chlorination time. At that time, it was doubted that pulp brightness was a sufficiently linear function of chlorination to be accepted as an index of bleaching. The laboratory test of chlorine residual, although not confirmed by intensive investigation, was then the accepted, workable control index for chlorination.

These investigations with pulp brightness continued, and by 1953 a refined version of the first photoelectric device was built. The Black Widow was then installed on the sight glass located after the chlorination tower in the pulp flow line, where it automatically controlled the chlorine feed rate in response to the brightness of the pulp flowing past the sight glass; when pulp brightness decreased, the chlorine feed valve was opened proportionately, when pulp brightness increased, the chlorine feed valve was closed proportionately. The Black Widow gave such generally favorable results that it replaced both visual rating and chlorine residual methods of control, and a patent application was submitted.

Further laboratory investigation of pulp brightness was postponed until recently, when it was desired to know how the Black Widow would respond to wide fluctuations in unbleached pulp K number and other system parameters. This study presented an opportunity to complete the postponed investigation as well as to determine precisely the relationship between chlorine residuals and degree of bleaching.

Black Widow Apparatus

The photometric head is the "sensing" element of the Black Widow apparatus and is mounted wherever brightness determinations are desired. Electrically connected to the recorder-controller, the photometric head delivers an electrical signal which is proportional to the brightness of the moving pulp, and thus a measurement of this signal results in a measurement of pulp brightness.

Breaking it down into its essential parts, the photometric head consists of a light source, dual light projector systems, and dual light-integrating spheres, all enclosed in a vapor-tight cover as illustrated in Figure 1. Figure 2 shows the head mounted on the sight glass with the cover removed.

The measuring system circuitry, except for the phototubes is contained within a recorder-controller. It consists of a Wheatstone bridge with a balancing unit which drives a balancing motor. This is known as a self-balancing bridge, and is the heart of the Black Widow measuring system.

To standardize the measuring system a means for checking and calibrating is provided. A calibrating standard plaque of highly stable porcelain enamel

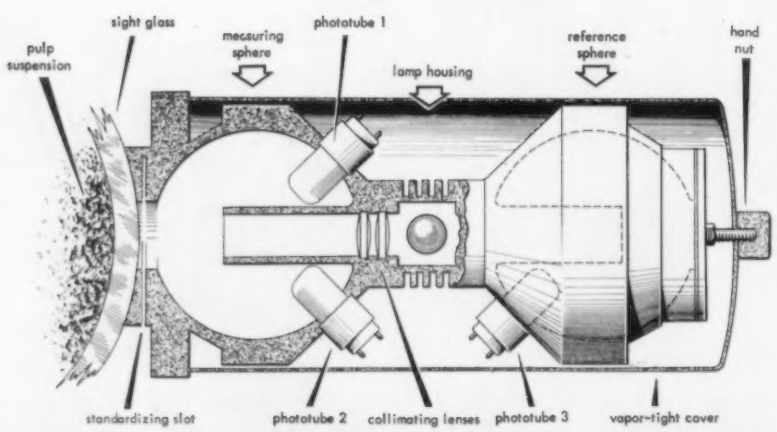


FIGURE 1—Photometric head details are illustrated here.

is used to intercept the light which normally goes to the pulp and by turning a standardizing control, the recorder reading is adjusted to the brightness value of the standard plaque or some arbitrary multiple of its value. This can be done conveniently every 24 hours at the same time the recorder chart is changed. Often no change can be detected over a period of several days.

Pulp Bleaching

The use of the Black Widow in the pulp bleaching process at the Luke mill has been confined to the chlorination stage and one hypochlorite stage. In these applications, attention had to be given to the location of the photometric head and several system variables which were shown to affect the operation of the Black Widow. Figure 3 is a flow diagram of the Luke mill bleaching system, showing location of Black Widow photometric heads.

Chlorination Stage. In the chlorination stage of the Luke mill, the photometric head is mounted on a sight glass approximately 7½ minutes away from the point of chlorine addition. A stock meter and consistency regulator maintains the pulp at a preset consistency and rate of flow, after which the pulp flows to a pump and chlorine mixer, through a chlorinator and then to the sight glass where the head is mounted. The pulp then proceeds to the chlorination tower and washer.

The recorder-controller adjusts the chlorine feed to maintain a preset brightness. It is mounted on the bleach room control panel and adjusts the chlorine feed valve. When the brightness of the pulp increases, the recorder-controller closes the feed valve proportionately, and when pulp brightness decreases, it opens the valve proportionately, thus maintaining the pulp at a nearly constant brightness.

Figure 4 illustrates the effect of other system variations on Black Widow operation by presenting the results of a detailed study of the bleach room operation for a portion of one day. Samples of unbleached pulp, chlorinated pulp, and pulp leaving the caustic extraction washer—all taken at carefully timed 30-minute intervals—were analyzed in the research laboratory. The data was then plotted in Figure 4 so that the results at any point are for the particular pulp entering the system at the indicated time.

This study reveals that the Black Widow was able to maintain the extracted pulp K No. essentially constant in spite of relatively wide system fluctuations. Even though the unbleached pulp K No. varied from 14 to 16, and the pulp feed rate increased from 280

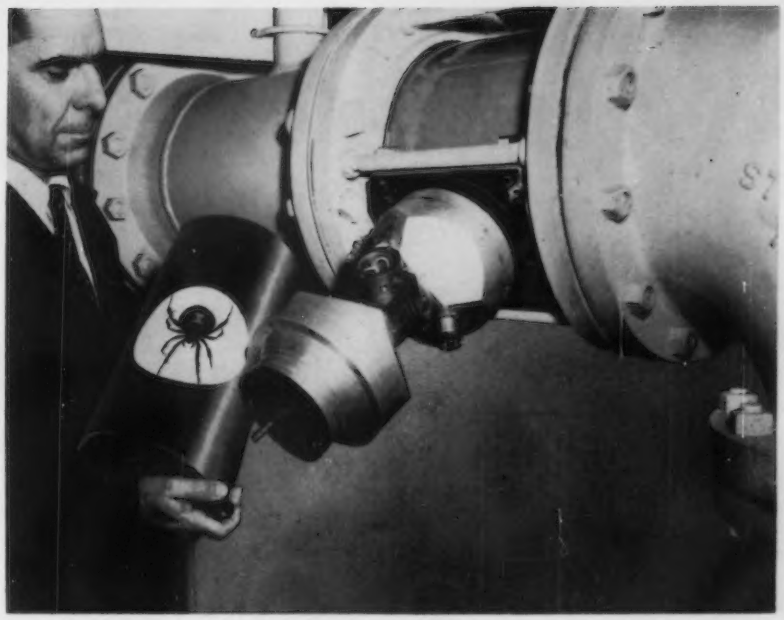


FIGURE 2—Sensing unit installed on sight glass. Cover is removed.

Summary

The "Black Widow" is a photoelectric device used to measure the relative reflectance of continuously moving pulp or paper. It consists of a photometric head mounted at the point of desired brightness measurement, and a measuring system. The photometric head contains two light-integrating spheres with phototubes, a light source, and a projector tube for each integrating sphere. These phototubes and a recorder-controller unit comprise the measuring system. The instrument is standardized periodically with a porcelainized reflectance plaque.

Pulp chlorination is the process in which the Black Widow has been most extensively used. In the continuous chlorination stage, where pulp consistency is low and where a sight glass can be installed, the device replaces both visual evaluation and chlorine residual tests as routine control methods. It provides a 24-hour record of relative pulp reflectance, automatically maintains a preset reflectance level, and results in a very uniform K number pulp leaving the chlorination and caustic extraction states.

It is useful, too, in hypochlorite and other high-density batch and semi-batch bleaching processes to provide the operator with relative pulp reflectance measurements which permit more exact subsequent bleaching. However, process variables which are not controlled within normal operating limits can affect the operation of the Black Widow. These include consistency, chlorination time, temperature, and time lag between the point of measurement and point of chlorine control.

Study with several pulps of different unbleached K Numbers confirmed the validity of brightness as an index of degree of bleaching. Chlorine residual, however, did not prove effective as an index for such control. The criterion used for judging the merits of these two methods was their degree of correlation with pulp K Numbers after caustic extraction; Black Widow brightness measurements of a series of pulp correlated very well with extracted K Numbers, and chlorine residuals of the same pulps did not.

Another application, not yet fully evaluated, is brightness measurement of continuously moving paper in a coating process. Here the Black Widow will provide a brightness index for manual control of pigment feed, and will ultimately automatically adjust the pigment feed valve to maintain a preselected brightness level.

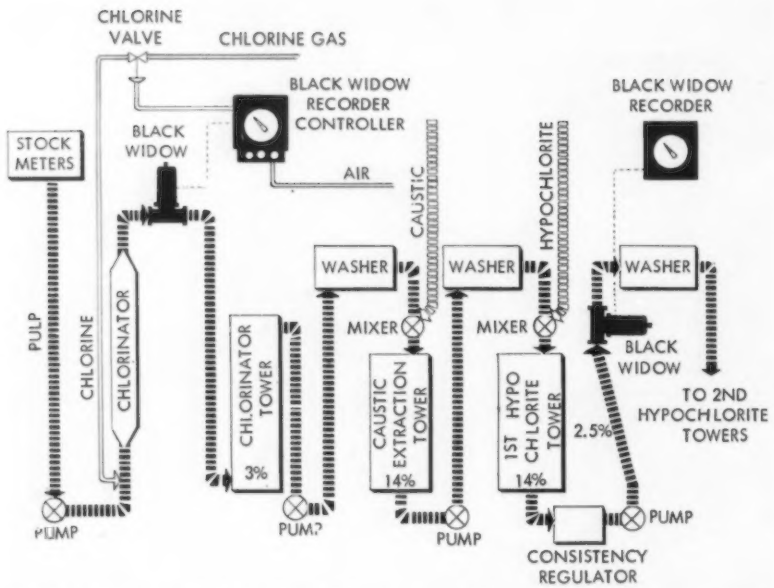


FIGURE 3—Luke mill bleaching system with Black Widow locations shown.

to 350 tons per day, the Black Widow kept the extracted pulp K No. within a narrow band of 5.0 to 5.7. It did this, as shown in Figure 4, by adjusting the chlorine feed rate from 1100 to 1420 pounds per hour.

Hypochlorite Stages. Figure 3 shows the location of a second Black Widow photometric head between the first and second hypochlorite stages. In this position it enables the operator to achieve more uniform bleaching in the second hypochlorite stage.

The first stage is a high-density continuous system, and several attempts to use the Black Widow immediately after the high-density mixer were not successful. When this equipment was originally installed, no provision was made for viewing the pulp at that point. No satisfactory scheme has been worked out for the purpose to date, although it is still under consideration.

The second hypochlorite stage is currently a multiple batch operation. It was found that by locating the photometric head on the line going to the washer following the first stage, the operator was able to determine much more precisely the correct amount of hypochlorite to add in the second stage batch units by observing the pulp brightness on the recorder.

Variables Affecting Operation. There are several system fluctuations that can, to varying degrees, affect the operation of the Black Widow because they change the brightness (or apparent brightness) of the pulp. Their effects have been nullified at the Luke mill either by regular mill bleaching equipment or by routine adjustments of the recorder-controller.

Consistency: Pulp consistency is one of the most obvious variables to consider and it was found that any reasonably good consistency regulator can eliminate serious effects from this cause.

Chlorination Time: The time between point of chlorine addition and the point of viewing is critical. If the volume of the system between point of chlorine addition and the Black Widow photometric head is constant, the effect of major changes in pulp flow rate, or reaction time, can be nullified by resetting the controller index.

Temperature: Because most chemical reactions are accelerated by increasing temperature, this variable must be considered for efficient operation of the Black Widow. Major changes in temperature are compensated by resetting the controller index for each temperature change.

Amount of Chlorine Applied: The effect of different amounts of hypochlorite on pulp brightness has not been investigated, but the variation in Black Widow brightness reading with the amount of chlorine applied has been studied and was found not linear. It has also been found to be dependent on the K No. of the unbleached pulp, as well as the kind of pulp used.

Time Lag: The time between point of chlorine application and photometric head viewing location influences the de-

TABLE I—DATA FROM EXPERIMENTAL PULP MILL

Bleaching No.	Black Widow Reading	Extracted Pulp K No.	(g/l) Chlorine Residual	Time Minutes	Temp. °C.
1	58	3.1	.087	90	45
2	54	3.3	.156	40	45
3	53	2.7	.083	60	45
4	49	3.4	.097	40	45
5	49	3.9	.156	40	36
6	49	5.5	.158	25	27
7	48	3.1	.100	60	45
8	48	3.7	.024	40	45
9	46	3.6	.075	60	36
10	46	3.7	.081	25	45
11	46	3.9	.080	90	27
12	43	4.4	.025	40	36
13	42	4.5	.071	90	18
14	40	4.8	.158	40	27
15	39	4.7	.082	40	27
16	38	5.0	.154	15	36
17	38	5.3	.022	15	45
18	37	3.9	.069	15	18
19	37	4.9	.166	40	18
20	36	5.0	.156	15	27
21	36	5.4	.089	40	18
22	35	5.5	.026	40	27
23	35	6.1	.081	15	27
24	34	5.4	.022	15	36
25	33	6.0	.164	15	18
26	33	6.0	.079	25	18
27	33	6.5	.035	15	27
28	30	6.6	.077	15	18
29	27	7.6	.025	15	18

gree of automatic control possible. This time should be kept as short as practical without getting below two minutes where control is difficult. Around six to ten minutes time lag permits reasonable control. The principal value of the Black Widow is its ability to detect and correct for the slow changes in bleach demand which are characteristic of most bleach processes, and which even the most alert and experienced operator has difficulty noticing.

Extraneous Light: Although the level of extraneous light has not affected the Black Widow reading at the Luke mill, it is conceivable that extraneous light on very bright pulps could affect the reading. If light is observed to do so, it may be necessary to construct simple light shielding at the sight glass.

Although all of these variables are well compensated at the Luke mill, perhaps other problems exist with other pulps; the Black Widow is no cure-all for all the problems which may arise in a bleaching process. It will measure pulp brightness and will often provide more exact control of the bleaching processes. Experience to date has been with only a few types of pulp and bleaching processes. The equipment is extremely rugged and stable, and easily maintained. Applications are limited only by the imagination of those having control problems where brightness or color changes are functions of reagent feed or other controllable process variables. Laboratory evaulation of possible uses for the Black Widow can be easily performed with almost any laboratory brightness meter, using flasks, beakers, bottles or other containers to hold the sample pulp suspension.

Black Widow vs. Residual Control of Chlorination

Correlation between Pulp Brightness and Extracted K No.

In the early stages of the Black Widow development, using pulp brightness as an index of the degree of bleaching was so seriously questioned, along with the possible effects of system fluctuations, that tests were begun to determine its validity. These consisted of laboratory brightness measurements of pulp suspensions at several degrees of chlorination, as well as brightness measurements at the sight glass in the pulp flow line.

When the photometric head was finally installed on the sight glass and the recorder given trial control of chlorine feed rate, the Black Widow gave such satisfactory performance that the validity of pulp brightness as an index of bleaching was no longer questioned. Further laboratory investigation was postponed indefinitely, and thus several questions were never fully and specifically answered until recently.

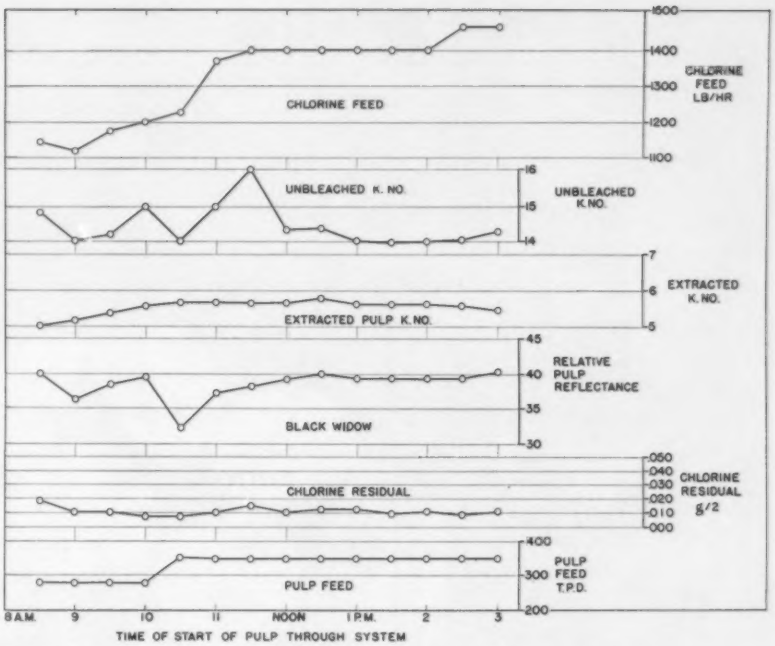


FIGURE 4—Effect of pulp mill variables on Black Widow operation.

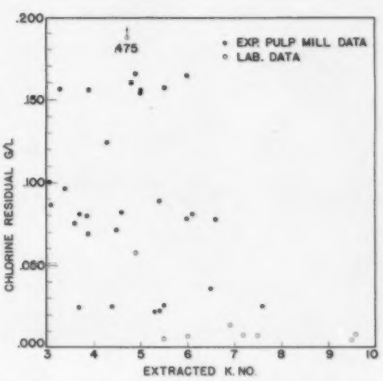


FIGURE 5 — Relationship between chlorine residuals and degree of bleaching.

The company's experimental pulp mill at Covington, Va., gave some of these answers with an investigation in which the two critical factors of time and temperature were deliberately varied. The Black Widow photometric head viewed the pulp leaving the chlorination stage just before the washer. The study, which is detailed in Table I, covered a series of bleachings over a period of several months, and only a very uniform K No. pine sulphate pulp was allowed to enter the system. The chlorination time varied from 15 to 90 minutes, and the temperature varied from 18° to 45° C. The correlation of Black Widow reading with extracted K No. was excellent considering these variations in time and temperature.

But the question still was not fully answered by this investigation, because a relatively uniform K No. pulp entered the system. What would happen if the entering K No. varied? This was answered by a laboratory scale study in which samples were chlorinated, given a caustic extraction and the extracted K Nos. determined. These predicted K numbers correlated closely with the experimental pulp mill data and indicate the validity of brightness as an index of bleaching.

Correlation between Chlorine Residuals and Extracted K Number.

These two investigations provided an opportunity to determine more precisely the relationship between chlorine residual and degree of bleaching. The chlorine residuals from both of these studies are shown plotted against extracted K Nos. in Figure 5, little if any correlation can be detected.

Acknowledgements

The author wishes to thank the many persons who have helped in the development and application of the Black Widow apparatus and system, especially William H. Seaber of the Luke Pulp Mill, James L. Tennant of the Covington Experimental Pulp Mill, A. M. Sively, Darius L. Green and the Research Laboratory technical staff and shop crew.

PRICES OF FIBERS

MARKET WOOD PULP

FIRST QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

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	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	§$90.00/ —	§$90.00/ —	§$90.00/ —
Bleached Gw'd.	$97.50/100.00	$97.50/100.00			
Kraft, Blchd.	157.00/ —	160.00/162.50	$157.00/162.50*		$157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		$137.00/ —		
Kraft, Semi-bleached	140.00/ —	140.00/ —			
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	155.00/ —	155.00/ —	*155.00/ —	*155.00/ —	155.00/ —
Sulphite Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd.	135.00/ —	135.00/ —	†135.00/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		134.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

NEW YORK RAG MARKET

New Domestic Cotton Cuttings

Delivered Mill Basis

PRICES NOMINAL

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.00
No. 1 Unblchd. Muslins	16.00/ 16.50
Blchd. & Unblchd. Underwears	15.00/ 15.50
No. 1 Light Silesias	7.00/ 7.50
No. 1 Light Blue Overalls	7.25/ 8.00
Percales	6.00/ 6.50
No. 1 Light Prints	5.00/ 5.25
Suntan Khakis	5.50/ 6.00
Cottonades	3.25/ 3.75
No. 1 Washables	2.50/ 2.75

Old Domestic Cotton Rags

(Prices to Dealers, f.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$3.00/$3.25
Cotton Pants & Overalls	2.00/ 2.25
Twos and Blues, Repacked	1.50/ 1.75
No. 2 Roofing	

COTTON LINTERS

Memphis Market

f.o.b. Oilmills

Week Ended February 3		For 100 lbs.
Grade 1 n.a.		
2	1 cut—felting	$9.50/ $9.25
3		8.50/ 8.00
4		7.75/ 7.00
5		6.75/ 6.25
6		6.00/ 5.50
7		5.25/ 5.00

*Based on 73% cellulose.

Old Rope & Bagging

(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts (soft)	$6.00/$6.50
Scrap Burlap	
Australian Wool Pouches	5.00/ 5.37
Gunny	4.75/ 5.00
No. 1 Domestic Manila Rope	7.75/ 8.25
No. 1 Foreign Manila Rope	6.25/ 6.50
Domestic Sisal Strings	

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

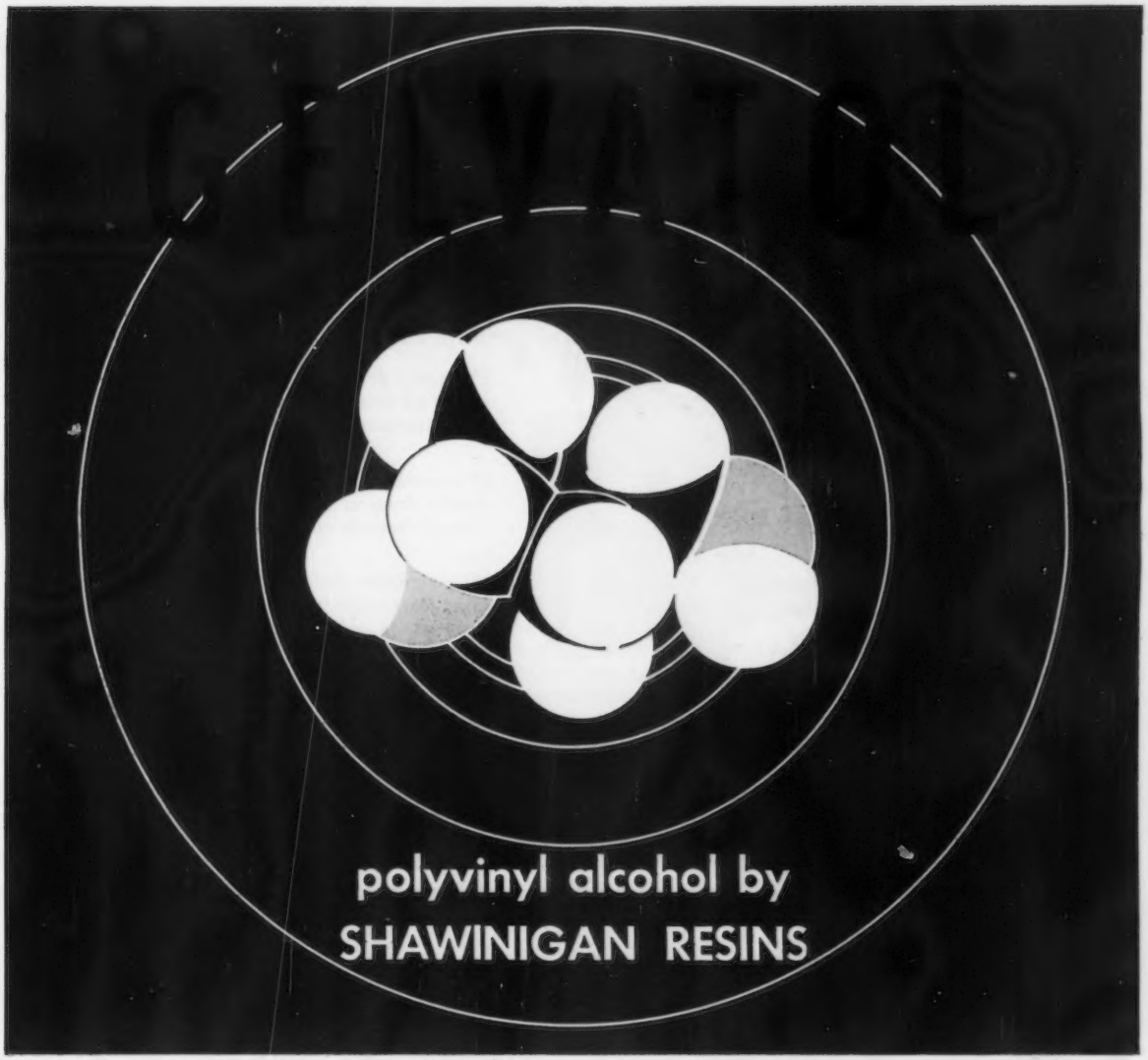
These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	February 3	February 3	February 3	February 3
No. 1 Mixed Paper	$5.00/ $8.00	5.00/ 7.00	4.00/ —	12.00/ —
No. 1 News	13.00/ 15.00	14.00/ —	16.00/ —	12.00/ —
Overissue News (Lg. size)	16.00/ 18.00	11.00/ 14.00	21.00/ —	16.00/ —
Mill Wrappers	11.00/ 13.00	12.00/ 14.00	7.00/ —	13.00/ —
Old Corrugated Containers	21.00/ 22.00	20.50/ 21.00	20.00/ —	20.00/ —
Super Resorted Kraft Paper	30.00/ 35.00	35.00/ 42.50	35.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts	25.00/ 30.00	32.50/ —	32.50/ —	30.00/ —
(Semi-chem. medium)	45.00/	37.50/ 42.50	45.00/ —	35.00/ 45.00
New 100% Kraft Corr. Cuts	50.00/ 55.00	50.00/ 55.00	55.00/ —	45.00/ —
New Br. Kraft, Env. Cuts	65.00/ 70.00	70.00/ 75.00	55.00/ —	50.00/ 55.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	50.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	65.00/ —	45.00/ 50.00
No. 1 Groundwood Shvs.	25.00/ 30.00	24.00/ 30.00	16.00/ —	25.00/ 30.00
White Newsblanks	50.00/ 55.00	50.00/ 57.50	35.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	60.00/ 65.00	55.00/ —	— / —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	65.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	100.00/110.00	90.00/ —	85.00/ 90.00
Hd. White Env. Cuts	115.00/125.00	120.00/130.00	100.00/ —	100.00/110.00
Col. Tab. Cards	50.00/ 60.00	55.00/ 62.00	47.50/ —	37.50/ —
Manila Tab. Cards	60.00/ 70.00	70.00/ 75.00	65.00/ —	75.00/ —
No. 1 Col. Ledger	28.00/ 33.00	30.00/ 32.50	40.00/ —	20.00/ —
White Ledger	45.00/ 50.00	50.00/ 55.00	52.50/ —	35.00/ —
Mixed Book & Mag.†	18.00/ 19.00	19.00/ 20.00	12.00/ —	— / —
No. 1 Books‡	25.00/ 27.00	22.00/ 24.00	27.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PRICES OF MATERIALS

Aluminum sulphate:			
coml. bulk, c.l. wks.	cwt.	2.00	/ —
iron-free, c.l. wks.	cwt.	3.55	/ —
Casein, acid prec.:			
dom. sh. pt. c.l. (30 mesh)	cwt.	56.00	/ —
Arg. ex. dock	cwt.	20.75	/21.50
New Zealand	cwt.	24.00	/25.00
Caustic soda:			
c.l. wks. solid, 76%	cwt.	4.30	/ —
flak. & grd. drums, c.l.	cwt.	4.70	/ —
liquid 50% tanks		2.90	/ 3.00
liquid 73% tanks		3.00	/ —
China Clay			
dom., dry-grd., airfloat:			
325 mesh bgs., c.l. Geo.	ton	10.00	/ —
300 mesh, bgs., c.l. Geo.	ton	13.50	/14.50
imp., white, lump, c.l. ex. dock		20.00	/35.00
Chlorine:			
single-unit tanks, works	cwt.	3.15	/ —
multiple unit, 2-5 cars per yr.		5.25	/ 4.05
Lime:			
hydrated, bulk, c.l. N.Y.	ton	23.63	/ —
quicklime, bulk, c.l. N.Y.	ton	22.13	/ —
Gum rosin:			
K, M, N, drums, c.l. Savan,	cwt.	7.64	/ 7.70
Rosin size:			
70%, gum & pale paste, tank cars, south, sh. pt.	cwt.	7.38	/ 7.48
Saltcake:			
dom. bulk, 100% anh. wks.	ton	28.00	/ —
Soda ash:			
light, 58% ash bags, wks.	cwt.	1.85	/ —
bulk, c.l. wks.	cwt.	1.60	/ —
Sodium chlorate:			
drums, c.l., wks.	cwt.	9.00	/ —
drums, l.c.l., wks.	cwt.	9.50	/10.50
Sodium peroxide:			
dms., c.l. E. of Miss.	lb.	.20½	/ —
l.c.l. (same basis)		.21	/ .21½
Sodium silicate, 40° Be.:			
tank-cars, wks.	cwt.	1.20	/ —
drums, c.l. wks.	cwt.	1.55	/ —
47° Be. WW.			
tank-cars, c.l. wks.	cwt.	1.90	/ —
drums, c.l. wks.	cwt.	2.25	/ —
Soybean, protein:			
chem. isol., wks. c.l. bags	lb.	.23	/ —
Starches:			
Corn, multiwalls, c.l. prod. plant:			
pearl	cwt.	6.49	/ 6.75
white, dextrins	cwt.	8.08	/ 8.20
chlorinated	cwt.	8.25	/ 8.35
potato, Idaho, c.l. wks.	cwt.	6.50	/ —
East, fr. all. 50 cents cwt.			
potato, Maine, f.o.b. wks.	cwt.	6.25	/ —
Sulphuric acid:			
60° Be. cbys. c.l. wks.	cwt.	2.00	/ —
l.c.l. wks.	cwt.	2.45	/ —
tank-cars, wks.	ton	18.60	/ —
Sulphur:			
crude, c.l. mines, contract,	long ton	23.50	/ —
f.o.b. vessels Gulf dock	ton	25.00	/ —
Sulphur dioxide:			
liquid, coml. cyl., wks.	lb.	.10	/ .12
multi-unit cars, wks.	lb.	.0535	/ —
Talc, fibrous grd., bags:			
c.l. wks., N.Y.	ton	28.00	/ —
l.c.l. wks., N.Y.	ton	31.00	/36.00
Titanium dioxide:			
anstase, c.l. dlvd. E. bags	lb.	.25½	/ —
l.c.l. dlvd.	lb.	.26½	/ —
rutile, c.l. dlvd.	lb.	.27½	/ —
l.c.l. dlvd.	lb.	.28½	/ —



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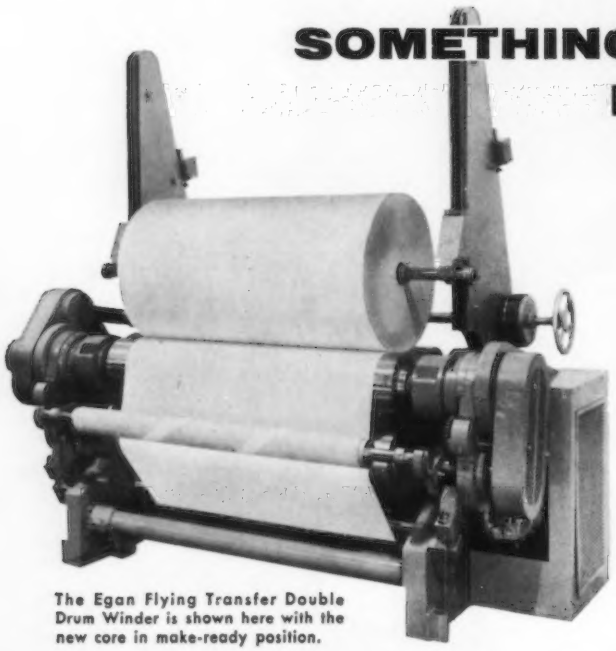
SOMETHING NEW IN DOUBLE DRUM WINDING...



The Egan Flying Transfer Double Drum Winder is shown here with the new core in make-ready position.

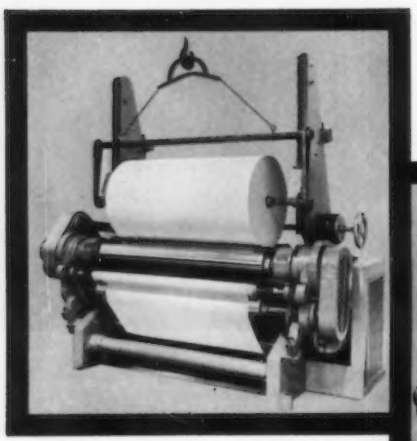
Flying transfers at speeds up to 1000 fpm

This newly developed Egan Double Drum Winder makes all other drum winders old-fashioned by comparison.

Changeover problems that formerly existed with double drum units are completely eliminated. Transfer is made at full machine speed.

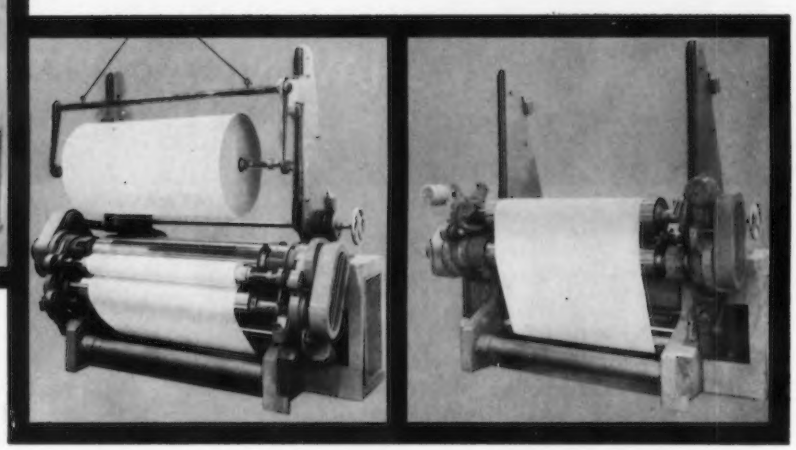
"Double drum winding" of the newly started roll takes place while the finished roll is being removed. In addition, the all new Egan Double Drum Winder assures hard wound rolls free from telescoping.

Write, or Phone Randolph 2-0200
For Complete Information—No Obligation.



Transfer is made between the front winding drum and a third drum at full machine speed.

Patent applied for



"Double drum winding" of the new roll begins. The finished roll is removed.

Completing the cycle, the new roll is shown being rotated into the main winding position.

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Where the Crofton Mill Gets Its Water and How It Treats It

The mill requires 35 million gallons of water every day and quality specifications are high.

John H. Bardsley
Technical Services Sup't.
B. C. Forest Products Crofton Mill

The Crofton mill of British Columbia Forest Products Ltd. is designed for a production of 500 air dry tons of bleached, long fibered, coniferous, kraft pulp of the highest quality and brightness. The water requirements for pulp of this quality are very exacting. The water must be crystal clear, with no color or turbidity. It must be very low in certain elements such as iron and manganese and it should be low in hardness. One other requirement: there must be a lot of it.

Quality and Quantity

Crofton's design of 500 tons called for 70 thousand gallons per ton or 35 million gallons per day. This is the basic design figure used for the mill water supply.

The mill site is a favorable location for wood and transportation. A good water supply is at Cowichan Lake, about 20 miles away, and the lake is being used as a reservoir. The water supply to the mill will be pumped from the Cowichan River over a hilly route some 10 miles long.

This calls for four natural divisions in the system. These are:

- Weir and Sluice at Cowichan Lake.
- Pump House on Cowichan River.
- Pipe Line.
- Filter and Water Treatment Plant.

Weir and Sluice at Cowichan Lake

Cowichan River is subject to large variations in the rate of flow. During the rainy season it is near flood, while during the dry season the flow can decrease until there is not enough for the operation of the mill. To smooth out and control this flow, a weir was built at the outlet of Cowichan Lake.

The intention is to hold back about two feet in the depth of the lake. This is equivalent to an additional 32,000 acre feet of water or enough to guarantee a satisfactory supply of water both for the mill and the city of Duncan. Enough water also will be there for other industry. The increased flow at former lowwater periods will also be beneficial to fish propagation.

At the selected site, a dam-like structure made of timber cribbing, filled with rock and faced on the upstream with five-inch metal Larsen sheet piling, has been built. The size of this structure is about 209 feet long by 10 to 12 feet deep and 15 feet thick. A concrete overflow lip extends from one end of the cribbing structure, a further 400 feet, as a safety overflow.

As Cowichan River is "navigable" by small pleasure craft, as well as being a fish road between the sea and spawning grounds, any obstruction placed in the river must allow free passage of both small craft and fish. For these reasons a small boat pass or lock and fishways were incorporated in the weir.

The boat pass or lock can handle small craft up to 29 feet 6 inches in length and up to 16 feet 6 inches in width. Each end of the lock is closed by a guillotine-like gate which is raised or lowered by a motor operated screw. The lock section is self-filling and emptying and requires no pumps.

To allow the fish to pass freely during low water periods, there are slots in the weir through which the fish may swim. The passage of the water through these fishways is part of the continual run off.

Pumphouse

The pump house is on the Cowichan River close to the city of Duncan water intake, and about ten miles from the mill site. To pump directly from the river to the mill site or to a distant treatment plant would introduce hydraulic problems, such as pulsations, variations, and water hammer. Instead the water is pumped from the river up to a surge tank on a hill so that the water then flows by gravity through the rest of the system. To reach this satisfactory elevation, it is necessary to raise the water some 232 feet. Accordingly, five Byron Jackson, 24K x H 2 stage vertical pumps, each capable of pumping 5700 U.S. gallons per minute at a 250-foot head are used. These five will deliver over 41 million gallons per day. There is space left for a further two pumps which would make the total from the seven more than 57 ½ million gallons per day.

To protect the pumps, and to keep as much foreign material out of the system as possible, three barriers are placed ahead of the pumps. The first is a stop log which consists of squared timbers in a suitable rack. This is used for shutting the water off from the river to allow work to be done in the pumphouse sumps. The next is a trash rack made of flat one quarter inch iron bars with ⅞ inch spacings. The third is a stainless steel, woven wire cloth, with 5½ x 5½ mesh and 0.054 inch wire. The gate opening for these barriers is about 22 feet wide by 15 feet deep.

The pumphouse is fully automatic, built of reinforced concrete without windows. This is in keeping with the

policy of low maintenance and minimum manpower.

The pumps discharge directly into a 48-inch, inside diameter, pipe line which carries the flow to the surge tank on the hill.

Pipeline

The topography was very carefully studied to find the best way to transport the water from the Cowichan Lake to the mill site.

The Cowichan River carries the water downstream from the lake, to where it is pumped from the river to a surge tank on a nearby hill. From here the water flows by gravity up and down the various hills over a distance of about nine miles to the water treating plant. This plant is sufficiently above the mill site to allow the water to continue another mile to the mill and still have sufficient gravity head to avoid further pumping. With the exception of the pumps at the pump house, and special purpose boosters in the mill, there are no other pumps on the water system.

The design of the pipeline is for 50 million U.S. gallons per day. Concrete cylinder pipe of 48 inches inside diameter is used. This is a composite steel cylinder and reinforced concrete pipe. The route chosen for the pipe line from surge tank to filter plant is nine miles with the greatest pressure in the pipe being a head of 202 feet of water and the lowest being only eight feet of water. This is allowing for a friction loss in the pipe of 1.94 feet per 1000 feet of length, or a head loss of 90 feet between the pumphouse and filter plant.

A 50-foot right of way has been purchased, and over most of the length the pipe is buried. Burying the pipe protects it and keeps the water cool.

Road, swamp and stream crossings were some of the problems solved, with the crossings of the Esquimalt and Nanalimo Railway and the two Island highways being the most important.

Filter and Water Treatment Plant

On the basis of 70,000 U.S. gallons per air dry ton of bleached pulp, and a production of 500 tons, the mill requires 35 million gallons per day.

The water treatment is with Northwest Filter Co. equipment and is a completely automatic water softening and treatment plant. The treatment takes place in three stages. First stage is the addition of chemicals and coagulation. Second, the settling section. Third, the filtration.

The installation is of reinforced concrete, rectangular in shape, about 13 feet deep and covers an area about 350 feet by 220 feet. The coagulation and settling sections are divided down the center and each may be used separately.

The plant is designed for the removal of color and turbidity and is guaranteed at a normal rating of 35 million gallons per day with a substantial emergency overload factor provided. The treated water contains not more than one part per million of either turbidity or color at the plant nominal rating. The layout is made to provide space for future expansion to 50 million gallons per day.

The plant design incorporates the use of automatic controls with proportioning chemical feed and an automatic and electrically monitored method of backwashing control, automatic basin and clearwell level controls, and an automatic emergency high filter rate in the event of abnormal low clearwell level. There is also a provision for remote alarm on low clearwell level which indicates in the boiler house.

From the treatment plant the clear water is piped about one mile by gravity to the mill, while the backwash water is piped by a shorter route, directly to the sea.

Chemical Addition and Coagulation

The chemicals added are chlorine for algae control and alum and soda ash for flocculation. Both the alum and soda ash are added as dry chemicals from automatic feeding hoppers. All the chemical rates are adjusted and set, after which they remain automatically controlled proportional to the flow of water. The coagulation section consists of eight cells in series, about 24 feet square by 14 feet deep. These are designed in such a way as to give proper mixing and to allow the most desirable floc to form. There are two complete units of this size. The coagulated floc then flows over a distribution wall into the settling area, where all the flocculated material is removed.

"Mr. Jenson, about that new cutterman you hired this morning . . . "

Settling

The settling area basin is about 220 feet long by 110 feet wide and is about 13 feet deep. There are two of these. The rate of flow through the settling basin is just over one foot per minute and gives a settling time of about three hours. Even without the addition of flocculating chemicals, a three-hour settling time removes all but the finest sediment and vegetable materials. The water then passing to the sand filters contains very little material to be removed.

Filtration

The filtering section is made up of 12 gravity sand filter beds, each 50 feet by 14 feet, or a total area of 8400 square feet. This gives a filtering rate of about 2.9 gallons per minute per square foot. Cleaning of the filter beds is by automatic backwash, electrically monitored.

The level in the clearwell below the filter beds automatically controls the water flow, and if the level drops too low, operates an alarm in the mill. The clearwell has a storage capacity of 1,182,500 gallons and besides being a reservoir, acts as a surge tank and gives a constant head on the mill system of about 100 feet. This makes most fresh water pumps in the mill unnecessary.

Control of Treatment

Although the complete water system, from reservoir to mill, has been made automatic, and does not require any routine attendants, a close check on the quantity of treatment and the quality, is kept. To allow routine samples to be taken, without the necessity of visiting the filter plant which is about a mile from the mill, a polythene pipe is installed alongside the main pipe line. This delivers a continual sample from the coagulation section of the treatment plant, after the point of addition of the chemicals, but before sedimentation or filtration. A routine examination of these samples shows whether the right amount of treatment is being given. Also, in periods of non treatment the time to start adding chemicals is shown. Any changes in the proportion of treatment are made by making a special trip to the filter plant.

How B.C. Forest Products Built Up a Pulp Mill Staff

J. L. Gallagher
Personnel Supt.
British Columbia Forest Products Ltd.

Carefully engineered and up-to-date machinery is available to anyone building a pulp mill. But for the finished mill to operate well and competitively, a staff is required of highly skilled and experienced men who have been selected to work together as a team. This was the theme of the recruitment program for British Columbia Forest Products' $46-million bleached kraft pulp mill recently completed at Crofton on southeast Vancouver Island.

The program was somewhat complicated because the firm was new to the pulp field and the bulk of the staff had to be recruited from outside the company.

Throughout North America

In setting its standards, B.C.F.P.'s management agreed that it was desirable to obtain as representative a staff as possible and that every effort should be made to draw on the experience of pulp mill in kraft mills throughout North America. Moreover, the firm realized that confining recruitment to a limited area could have a serious effect on mills in that area and would be poor industry relations.

A further decision had to be made in connection with the recruiting program. Two choices are normally open to a new firm. It can obtain men experienced in their jobs or it can upgrade men beyond their present jobs.

Because of the training necessary even for experienced men in a new operation, the former course is preferable. As construction on the mill progressed, spontaneous interest shown by prospective employees indicated this was possible. Consequently, the mill will initially be staffed entirely by men with considerable background in their jobs.

Recruited in Four Phases

The recruitment was conducted in four phases: 1) Top supervision; 2) Technicians and foremen; 3) Key operators and tradesmen; 4) Semi- and unskilled men. The first phase and part of the second was completed by late 1956 with all the top supervisory appointments being finalized by that time.

Early in 1957 advertisements were placed in newspapers across Canada for key operators and tradesmen with what the company's personnel people called "phenomenal results." In fact, the results were a little too favorable. The replies came in so rapidly and in such quantity that the procedure for handling them nearly collapsed under the weight of numbers. For over a month, replies averaged 60 a day, and two months later were still coming in at the rate of 20 a day.

The guiding policy in processing these applications was that every one was to receive either an application form or a negative reply. Applications were received from as far away as New Zealand, Norway, Texas, Alabama, and Canada's Maritime provinces. There were also inquiries from Ireland and the United Kingdom.

The replies ran the gamut from the sublime to the ridiculous. The vast majority, however, were from highly competent men which made selection difficult. A few were only interested in fishing and the small boat-handling facilities; these were easy to dispose of.

Screening

After a month had elapsed, it was felt the most worthwhile applicants had returned their application forms and the selection committee consisting of the general superintendent, personnel supervisor and either the maintenance superintendent—in the case of mechanical trades, or the supervisor's foreman concerned—in the case of the operating jobs—worked together to separate those warranting further consideration from those which failed to measure up. The object was to reduce the application in each category to a small number to simplify the final choice.

To make a satisfactory comparison, three members of the selection committee made a trip across Canada to interview the most promising applicants from out of the province.

As the result of impressions gained from interview, references and checking background, the committee was then in a position to select the best men.

In addition to the normal selection methods, psychological test batteries, administered by a firm of management consultants, were used as an aid in selection of staff personnel.

Local Residents

Although B.C.F.P. realized that very few of the local residents would have the appropriate experience for skilled employment, the basis of the recruiting program was to hire for the mill as many local residents and to employ as many of its own employees as possible. Results of this phase of the recruiting program were particularly pleasing.

Sixty-nine employees were hired from the area around the mill and 41 employees already with the company were transferred to the mill.

By mid-January, 1958, the mill was conducting test runs and the recruiting program to staff the 285 jobs provided by the mill was virtually complete.

Key Personnel in British Columbia Forest Products Ltd. Pulp Division

Charles D. Dickey Jr., president, has been a member of the board of B. C. Forest Products since December, 1955. Prior to his election as president, Mr. Dickey was assistant vice president of Scott Paper Co., responsible for west coast operations with headquarters in Everett, Wash. He joined Scott Paper in 1946 as a member of its sales force in New York City.

Walter W. Holland, vice president, pulp, started with Canadian International Paper Co. at Hawksbury, Ont., as a research assistant. Three years later he joined Manson's Ltd. He then went to Pulp and Paper Research Institute for six years. After a two-year association with Price Brothers, Mr. Holland joined Ontario Paper Co., where he served 14 years, becoming general superintendent. In the following four years he was with Oxford Paper Company, as mill manager in Rumford, Me.

A. Morton Richmond, manager-pulp sales, joined B. C. Forest Products in 1949 as executive assistant to the president. A graduate in mining engineering from the University of British Columbia in 1927, Mr. Richmond served in the mining field with the B. C. Department of Mines and as a consultant to private companies.

John R. W. Grieve, mill manager, worked for Brown Corp. at LaTuque, Que., since graduation from the University of Toronto in 1937. He became general superintendent of the mill in 1950 and remained in that position when the operation was purchased in 1954 by International Paper Co.

Donald H. Baker, assistant mill manager and technical supervisor, was technical supervisor and assistant to the manager of the Harmac mill of MacMillan & Bloedel from 1950 to 1955. Mr. Baker joined B. C. Pulp and Paper Co. in 1935. Later he worked for Defence Industries Ltd. and the first Sloan Forestry Commission. In 1950 he joined H. A. Simons as project engineer.

Edward G. Wilson, general superintendent, entered the pulp industry in 1936 at Port Mellon, B. C. and joined Pacific Mills at Ocean Falls in 1941. From 1945 to 1954 he was with Kalamazoo Vegetable Parchment Co. Ltd. at Espanole, Ont. More recently he was kraft mill superintendent at Continental Can Co.'s Hopewell, Va. plant.

Geoffrey S. G. Jones, resident engineer, spent a number of years in the paper industry in eastern Canada before joining Bloedel, Stewart and Welch at Port Alberni, B. C., in 1947. From 1950 until joining B. C. Forest Products in the fall of 1956, he was with MacMillan and Bloedel at Harmac, B. C., as assistant plant engineer.

Donald N. Pederson, office manager and accountant, held the same position with Scott Paper, Coos Bay, Ore., before joining B. C. Forest Products in June, 1956. Mr. Pederson graduated from the University of Washington in 1941 and served five years with the tire pricing board of the U. S. Army at Detroit, Mich. He moved to Scott Paper in 1946.

John L. Gallagher, personnel supervisor, worked in B. C. F. P.'s logging and sawmill operations from 1947 until his present appointment in 1955. Mr. Gallagher attended the University of British Columbia and in 1942 entered the Canadian Army as a private, being discharged as a major. He entered personnel work in 1947.

John H. Bardsley, technical service superintendent, graduated from University of B. C. in 1933 and joined the Powell River Co. From 1942 until 1957 he was with the St. Lawrence Corp. in the technical service department, where he held various positions before becoming technical superintendent.

Thickening of Groundwood

Dr. K. H. Klemm
Manager, München Dachauer Papier Fabriken
Munich, Germany

English text by
G. P. Chinn

The aim of the de-watering operation on the dilute stock coming from the screens is to obtain a maximum fiber yield in the thickened stock or, in other words, to remove only water. For consistencies up to 12 per cent (sufficient if the pulp is being concentrated only for immediate consumption) thickeners or filters can be used. If the pulp is to be stored or transported, the higher consistencies (25-35%) necessary are obtained with wet lap machines. In special cases (e.g. high density bleaching) higher consistencies are required within the continuous production process. This is obtained with screw presses which concentrate the pulp from four to six per cent up to 45 per cent.

Operating Principle of Thickeners

With the exception of the screw press, all machines used for de-watering groundwood work on the same fundamental principle. As shown schematically in Figure 1A, the basic design is a vat (**a**) in which a wire covered cylinder (**b**) revolves. The groundwood is fed directly or from a headbox to this vat at (**c**). Because of the difference in height between the stock in the vat and the water inside the cylinder, the water passes through the cylinder wire where the fibers are deposited as a filter layer. This layer becomes continuously thicker as the cylinder revolves submerged. After leaving the liquid level, the thickened stock is picked off the wire by the couch roll (**d**) and removed from there by the doctor (**e**). With the Miag Co.'s construction shown in this figure, an overflow of partially thickened stock leaves at (**f**) and is recirculated to the headbox by the pump (**g**). With many other types, this overflow goes directly to the thickened stock chest. In this particular design, the cylinder moves in the same direction as the flow of stock. Other thickeners work on the counterflow principle, as indicated by the Shartle air pressure thickener shown in Figure 1B. This also illustrates a recent trend which does away with the couch roll. In the case of the Shartle thickener, a heavier wire is spirally wound on top of the filtering wire. This supports the doctor (**h**) which removes the stock directly from the cylinder. Stock discharge is aided by an air pressure supplied from the chamber (**i**) inside the cylinder. Figure 1C shows the Apmew thickener which has neither couch roll nor doctor. The thickened pulp overflows at (**k**) directly into the stock chest. These last two designs are only suitable for relatively free groundwood and concentrate to consistencies of three to five per cent. Practical experience has indicated that, to date, the couch roll is still the simplest and cheapest way to remove the stock from the cylinder. By eliminating the couch roll, it was expected that the life of the cylinder wires would be considerably increased. This has not shown up in practice as it appears that corrosive and electrochemical forces have a greater influence on wire life than wear caused by the couch roll.

The thickeners in which vacuum is applied, generally called filters, are based on much the same principle as the types described above. The main differences are the use of larger diameter cylinders and special design features which are necessary to permit the application of a vacuum. In this case, the white-water must be removed through the hollow shaft of the cylinder which in turn must be specially constructed.

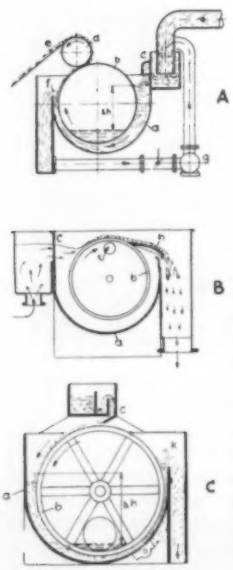

FIGURE 1—PRINCIPLE OF GROUNDWOOD THICKENING

A—Thickener with couch roll. B—Thickener with doctor. C—Thickener using direct overflow principle.
a—Thickener vat; b—Wire covered rotating cylinder; c—Stock headbox; d—Couch roll; e—Doctor on the couch roll; f—Overflow for partly thickened stock; g—Recirculation pump; h—Doctor on thickener cylinder; i—Air pressure chamber; k—Overflow into thickened stock chest; △h—Pressure difference.

Thickener Design

The cylinder is the most important part of the thickener. One design is shown in Figure 2. Two cylinder ends or flanges (**a**) are connected by metal rods (**b**) which carry the frame (**c**) on which the backing wire (**d**) is supported. The facing wire (**e**) is, in turn, laid over this. The end flanges are designed with a projecting ring which matches a similar construction on the ends of the vat. A sealing strip (**f**) is placed around these two flanges effectively closing off the inside of the cylinder from the liquid in the vat. The maintenance of these sealing strips requires constant attention if leaks are to be prevented and in order to keep the white-water consistency as low as possible.

Some data given in a publication of the Mechanical Pulping Committee, Technical Section, Canadian Pulp and Paper Association (1) are useful to indicate practical operation of thickener cylinders. Usually the rods are of brass or bronze and have a life of about 10 years. The supporting body is generally made of copper with stainless steel and Monel being used when relatively high temperatures or low pH prevail. Preferably, the same material should be used for all parts including the backing and facing wires. The combination of copper and stainless steel, especially, should be avoided as this is favorable for electrochemical corrosion effects. The backing wires usually have four strands to the inch and a life of about one year for bronze and Monel and two and a half years for stainless steel. The facing wire is 8–10 mesh. Within reasonable limits, the wire mesh used has only a relatively small effect on the fiber yield and the consistency of the white-water. These are more dependent on the filtering effect of the fiber layer formed on the wire and the thickness which that layer attains. Facing wire has the following average life: stainless steel, 340 days; bronze, 175 days; Monel, 100 days; and old machine wires, 30 days. These "life" figures can vary considerably with local conditions. When considering these data, it must be realized that the life figures for stainless steel and Monel are from mills where conditions are favorable for corrosion and, therefore, cannot be compared directly with the figures given for bronze. Under comparable conditions, the difference between the life of stainless steel and Monel as compared with bronze wires would be even greater. The life of wires increases by 10–12 per cent per 0.1 pH increase and decreases about three per cent for 1°F. temperature increase for all metals. Corrosion is the major factor influencing the wire life. Its rate is dependent upon the pH, temperature, air content of the stock and electrochemical conditions.

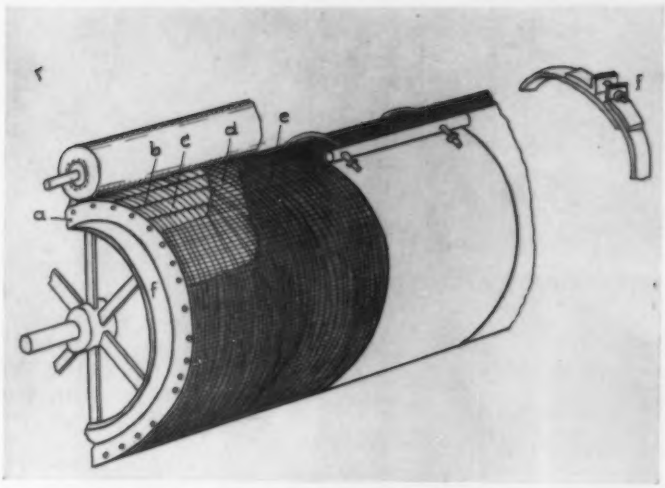

FIGURE 2—DESIGN OF THE THICKENER CYLINDER

a—Cylinder head; b—Metal rods; c—Frame for supporting the backing wire (in this case a spiral wire); d—Backing wire; e—Facing wire; f—Sealing strip (between cylinder and cylinder vat).

The couch rolls are 12–24 inches in diameter and slightly longer than the cylinders. They are made from wood or iron pipe covered by felt, manchon or rubber. If the latter, a rubber thickness of 0.5–1.0 inches and a 90–225 Pusey-Jones hardness is usually used and its life is practically unlimited. Felt and manchon coverings are 0.5–2.0 inches thick and last from one to two years. The wires are periodically cleaned with high pressure hot or cold water jets or steam. At shutdowns, frequently the wires and vats are given a chemical cleaning (e.g. caustic soda). For cylinder maintenance, 14 man-hours are required to replace the supporting body and 9–10 man-hours for changing the backing or facing wires.

Thickener Capacity

There is very little information available regarding the capacity of groundwood thickeners. A recent paper on this field is that of Walsh (2) in which measurements made in Canadian groundwood mills are compiled and compared. The findings indicate that thickeners and filters with couch rolls are the most efficient machines. The application of vacuum, to date, has not increased (and can even decrease) the capacity when related to the surface area of the wire. In this respect, it is the surface speed of the cylinders which is of the most importance. At first glance it is surprising that vacuum filters may show an even lower capacity per wire unit area than thickeners. However, it was not sufficiently recognized that it is the deposited fiber layer and not the wire which is the effective filter medium. When normal quality groundwood is the filter medium (as with groundwood filters and thickeners), this filter medium is comparatively dense. All forces which tend to increase the average thickness of the fiber layer on the wire, therefore, influence the capacity. The thickness of the fiber layer increases with:

1—The time over which a unit wire area of the cylinder is used for filtrasign, an installlation of *Voith thickeners.* With normal stock conditions and opti-

TABLE I—THICKENER CAPACITY DATA

	Cylinder Shaft Speed r.p.m.	Cylinder Diameter feet	Peripheral Speed ft./min.	Capacity tons (o.d.)/ft.² wire
Drum Filter	5	8	125	0.101
Drum Filter	6	8	150	0.143
Thickener	18½	3	175	0.151
Drum Filter	7½	8	190	0.155
Thickener	23	3	215	0.168
Thickener	20	4	250	0.160
Thickener	24	4	300	0.111

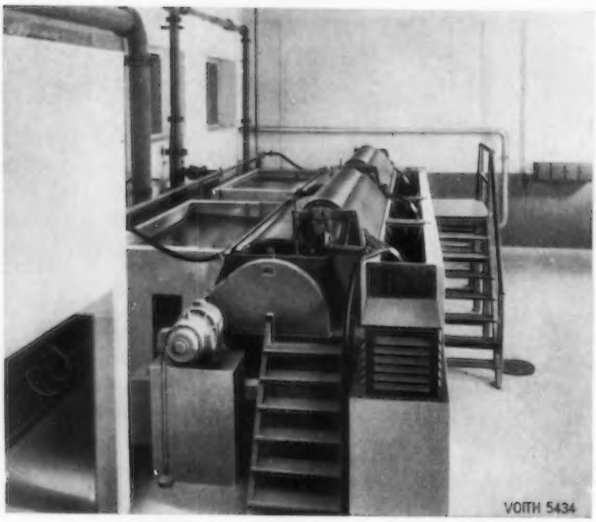

FIGURE 3—INSTALLATION OF VOITH THICKENERS

FIGURE 4 — IMPCO VACUUM THICKENER (Lindblad Filter).

tion (i.e. with decreasing peripheral speed or with greater submergence at the same r.p.m.).

2—Increasing consistency of the feed.

The optimum filter thickness depends upon the freeness of the groundwood which, in turn, influences the porosity of the filter layer. Until this optimum thickness of the fiber layer is reached, the capacity per unit wire area increases while the consistency of the white-water filtrate decreases. If the wire is not submerged long enough (speed too high) for this optimum thickness to be built up, the capacity per unit wire area decreases and the white-water consistency increases with respect to optimum conditions. If the wire speed is too low, the optimum thickness of the fiber layer is exceeded, the white-water consistency decreases further but the thickener has a lower than optimum capacity. With a given construction, the most important method for controlling its operation at optimum conditions is by varying the cylinder shaft speed. In this way, with the cylinder diameter fixed and the depth of submergence only adjustable within relatively narrow limits, the correct drainage time can be set to suit the feed consistency and freeness. The filter and thickener capacity data shown in Table I are applicable to newsprint quality groundwood.

As can be seen from the table, thickeners and filters very often are operated at too low a cylinder shaft speed and, if this were increased, a capacity increase would result. It must be realized, however, that, all other conditions remaining constant, an increase in the the peripheral speed of the cylinder always is related to a decrease in the consistency of the thickened stock and an increase in the white-water consistency.

The capacity per unit wire area, however, should not be the sole basis on which to select thickening equipment as the following considerations may carry more weight:

1—The installation cost

2—The maintenance cost

3—Maintaining uniformity of equipment types

4—The capacity per day and the floor space requirements

5—The consistency of the thickened stock

6—The consistency of the white-water.

Thickeners Versus Filters

From the point of installation costs, the normal thickeners appear to be the most favorable. However, their maintenance costs are higher than drum, although lower than disk, filters. Where floor space is important, as shown in the Table II, the disk filter gives much better results than all other types.

If high consistency thickened stock is necessary, vacuum filters show to best advantage. Consistencies of eight to ten per cent can be obtained on drum and disk filters against five to seven per cent on modern thickeners. (In this respect, see the discussion on the importance of consistency of the thickened stock in relation to the temperature of the groundwood white-water system). Filters also give the more favorable results with respect to the consistency of the white-water: modern thickeners, 0.04-0.9 per cent; drum and disk filters, 0.02-0.04 per cent.

The foregoing data provide a comparison between thickeners, drum filters and disk filters under normal feed stock conditions (i.e. consistency, 0.45-0.55%; Canadian Standard freeness, 90-115; temperature, 120-140°F.) Where the conditions are not ideal for stock thickening, several possibilities exist for improving them. The installation of modern high capacity screens has increased thickening capacity in many cases by delivering a higher consistency pulp to the thickeners. In addition, an increase of the feed temperature or freeness aids the filtering rate and, therefore, cylinder capacities. The above discussion shows that the commonly given capacity figures for thickeners and filters are meaningless unless the temperature, freeness and consistency of the feed and the consistency of the thickened stock and filtrate white-water are also stated. In addition, the required floor space should be given.

In the following, a few examples of modern thickening equipment are shown.

Modern Thickener Types

Figure 3 shows, as a European de-

TABLE II—THICKENER CAPACITY PER UNIT FLOOR SPACE

Modern Thickeners	0.185	tons (o.d.)/ft.²	floor	space	
Drum Filters	0.154	"	"	"	"
Disk Filters	0.272	"	"	"	"

mum cylinder shaft speed, the characteristic data are:

Cylinder diameter	4.1 ft.
Cylinder shaft speed (optimum)	20-22 r.p.m.
Consistency:	
Thickened Stock	6-8%
White-water	0.05-0.07%
Capacity—related to wire area	0.145-0.165 tons (o.d.)/ft².
Capacity—related to floor space (Standard model, 4.1 ft. Cylinder diameter, 11.8 ft. long, 19 tons (o.d.)/day)	0.205 tons (o.d.)/ft².

The *Cowan Thickener* is a recent North American construction and differs from the Voith design primarily in that the white-water is removed through only one end of the cylinder. Characteristic data are:

Cylinder diameter	4 ft.
Cylinder shaft speed	24 r.p.m.
Consistency:	
Thickened stock	5-6%
White-water	0.06-0.08%
Capacity—related to wire area	0.154-0.175 tons (o.d.)/ft²..
Capacity—related to floor space (Standard model, 4 ft. cylinder diameter, 14 ft. long, 27.5 tons (o.d.)/day)	0.185 tons (o.d.)/ft².

In Figure 4, the *Impco* (which is equivalent to the Swedish Lindblad (3) (4) *Vacuum thickener* is shown. This design falls half-way between the thickeners and the filters and is referred to under both names. As can be seen the special construction of the cylinder is designed to create a certain vacuum effect. This is reflected in the relatively high consistency of the thickened stock. Operating figures:

Cylinder diameter	6.5 ft.
Cylinder shaft speed	10 r.p.m.
Consistency:	
Thickened stock	8-10%
White-water	0.03-0.05%
Capacity—related to wire area	0.144-0.165 tons (o.d.)/ft².

With higher cylinder shaft speeds (17 r.p.m.), capacity can be increased to 0.175 - 0.195 tons (o.d.)/square foot of wire area. However, the consistency of the thickened stock decreases from five to seven per cent. Under these conditions, the standard model (6.5 ft. cylinder diameter, 14 ft. long, 17 r.p.m.) has a capacity of 55 tons (o.d.)/day or 0.223 tons (o.d.)/square foot of floor space. A similar German construction is the Imperial Turbine Vane filter.

Vacuum Drum Filters

The most common filters of this type are the various models of Dorr-Oliver Inc., such as the Oliver-Young and the Oliver Ring-Valve filters. European design include the Voith vacuum

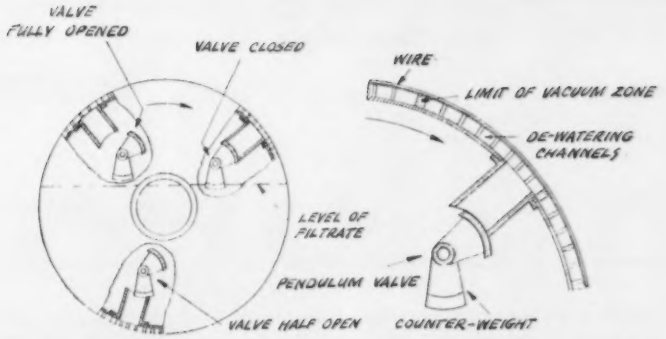

FIGURE 5—OPERATING PRINCIPLE OF COUNTERWEIGHT OF OLIVER-YOUNG FILTER.

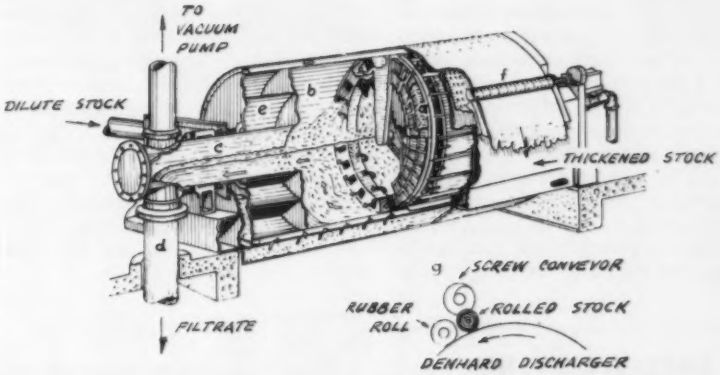

FIGURE 6—OPERATING PRINCIPLE OF OLIVER RING-VALVE FILTER. a—Ring-valve; b—Collector ring; c—Filtrate discharge pipe; d—Filtrate drop-leg; e—Cylinder reinforcing; f—Denhard discharger.

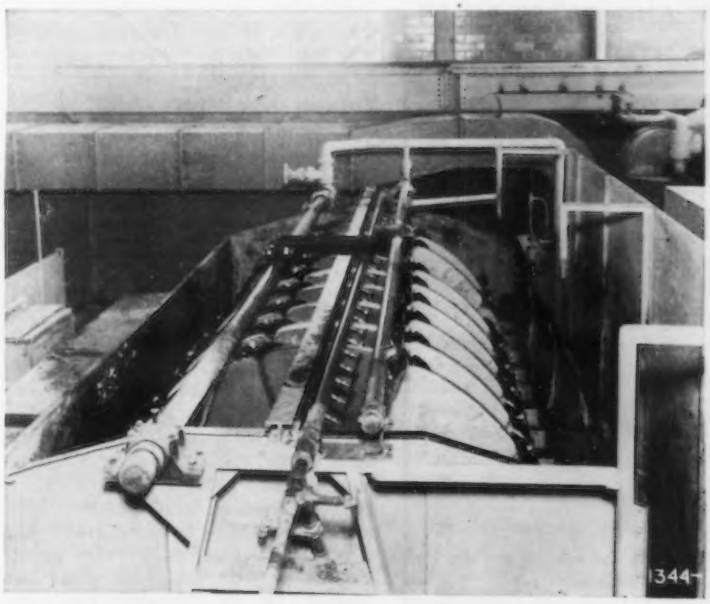

FIGURE 7—AMERICAN DISK FILTER IN OPERATION.

TABLE III—CAPACITY DATA FOR DISK VACUUM FILTERS

No. of Disks	Wire Area—ft.²	Capacity in tons (o.d.)/day
6	600	55
7	700	64
8	800	73
9	900	82
10	1000	91
11	1100	100
12	1200	110

and the Imperial Strindlund filters. In Europe, this type of thickening equipment is seldom used for groundwood and recent installations in North America have also favored thickeners. The main reason for this may be the high installation costs which, except for a higher consistency of the thickened stock, are not balanced by other advantages. The capacity, related to either unit wire area or to floor space, is not higher than that of the modern thickeners and the difference in the amount of maintenance required is not very much in their favor.

In the light of these facts, it is not necessary to discuss the various designs in detail. As an example, Figure 5 shows the principles of the Oliver-Young, and Figure 6, the Oliver Ring-valve filter. Both designs are used in North American mills for thickening groundwood. The Denhard discharger illustrated in Figure 6 represents an effort to eliminate the couch roll and so increase the wire life. However, usually no pronounced advantages have been observed. As discussed earlier, wire life is not so much dependent upon the pressure exerted by the couch roll as by corrosion and electrochemical forces. In addition, when installed with a Denhard discharger, filter capacity decreases. A vacuum discharge design (also used in groundwood mills) has proven more satisfactory than the Denhard discharger but generally, best results are still obtained with the couch roll. Characteristic data for this type of filter are:

Drum diameter	8 ft.
Drum shaft speed	7½ r.p.m.
Capacity—related to the wire area	0.154-0.175 tons (o.d.)/ft².
Capacity—related to floor space (drum diameter, 8 ft.; drum length, 14 ft.; capacity, 50 tons (o.d.)/day)	0.154 tons (o.d.)/ft².

The capacity figure related to unit floor space is even less than obtained with the thickeners discussed earlier.

Vacuum Disk Filters

With the disk filter, the wire area is increased in a manner to save space and the resulting capacity—about 0.272 tons (o.d.)/square foot of floor space—is considerably greater than any of the other filters or thickeners. Disk filters were built in Europe before the war by R. Wolf of Magdeburg, Germany, but as far as is known, were not used extensively in groundwood mills there. In North America, the American disk filter, manufactured by Dorr-Oliver Inc., is used in many groundwood mills. Figure 7 shows such a filter under operating conditions. The white-water is removed under vacuum from inside the disks (covered on both sides by a filter mesh) through a hollow shaft. The vacuum is obtained by a pump and/or barometric leg. The filter disks are arranged on the hollow shaft at right angles to its center line. They are divided into self-contained sectors, each of which is covered on both sides with a wire mesh. The disks are connected to the hollow shaft which is also divided into sectors. These end in a governor header so arranged that the vacuum is broken as soon as the disk has traveled into the discharge zone. The filter vat is divided lengthwise along the center line of the shaft. The dilute stock is retained in the back portion and in the narrow troughs which extend forward to enclose the disks to a height just above the vat level. The revolving filter disks pick up a layer of thickened stock as they pass through the dilute feed. This layer is then removed by water jets and falls down into the front portion of the vat which acts as a collection chamber. The standard filter has a nine foot disk diameter and 6-12 disks per filter. Capacity data are shown in the Table III.

The ratio of wire area to the required floor space is relatively large (e.g. with the 10-disk filter, 2.8 square feet per square foot of floor space compared with 0.65 square feet per square foot of floor space for the Cowan thickener). This is the reason for its capacity per unit area of floor space being so much higher than for all other types of thickening equipment. Disk filters are recommended, therefore, whenever a high tonnage is required for a minimum available floor space. The installation and maintenance costs, however, are higher than for thickeners or drum filters. Optimum results can be expected from stainless steel frames and wires, although recently trials with nylon coverings have proven very successful. One important advantage of disk filters is that, as the sectors can be changed individually in a very short time, there are practically no operating time losses for wire changing as occurs with both the thickeners and drum filters. From actual experience with groundwood, the disk filter is the only vacuum type filter construction which shows any advantage worth mentioning when compared to thickeners.

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NEWS OF CONVERTERS

Edwin D. Dodd

Matthew A. Oliver

Advanced at Natl. Container

Edwin D. Dodd, for the past two years factories manager of Libbey Glass Division of Owens-Illinois Glass Co., has been elected vice president and assistant general manager of National Container Corp., an Owens-Illinois subsidiary.

Mr. Dodd will have general responsibility for operations of National Container's 19 corrugated shipping container plants, under supervision of Lester R. Edwards, president and general manager of National Container.

Mr. Dodd will be succeeded in the Libbey post by Bruce F. Trumm, now general manager of O-I's Kaylo Division.

New Sales Manager for Brown-Bridge

Brown-Bridge Mills Inc., Troy, Ohio, has announced the retirement of H. T. Blair, vice president and general sales manager. Mr. Blair joined Brown-Bridge in 1930 and was a manager of the Chicago office of the company until 1950. In 1950 he was appointed manager of the flat paper sales department and then promoted to general sales manager and vice president in 1954.

Howard Murgatroyd, formerly assistant sales manager, has been appointed general sales manager to succeed Mr. Blair. Mr. Murgatroyd was formerly associated with the McLaurin-Jones Co., Brookfield, Mass., as divisional sales manager and then as assistant sales manager of the fine paper division of Ludlow Papers, Inc. Needham, Mass. He joined the staff of Brown-Bridge in June of 1957 as assistant to Mr. Blair.

Named Pacific Manager for Lily-Tulip

Matthew A. Oliver has been named Pacific Region Manager of Lily-Tulip Cup Corp., and will headquarter in San Francisco.

Mr. Oliver, who has been associated with Lily since 1939, was recently staff assistant to the vice president of marketing in the New York office, and prior to that was sales manager of the Pacific area.

Woolley Succeeds Wilkins at Hygrade

The retirement of Edward Wilkins as general manager of Hygrade Containers Ltd. has been announced, effective Feb. 15, by Canadian International Paper Co., of which Hygrade is a wholly-owned subsidiary. Mr. Wilkins will be succeeded by J. T. Woolley, now general sales manager of the company.

Mr. Woolley joined Hygrade Containers Limited in 1945. Since Hygrade Container became a subsidiary of Canadian International Paper Co. in 1955 he has functioned as its assistant general manager as well as general sales manager. No appointment of a new general sales manager is contemplated at this time.

Canadian Pad & Paper Appoints Officers

Canadian Pad & Paper Co., Toronto, has appointed H. L. Muir, vice president and general manager, J. A. Patterson, vice president and director of sales, and P. C. McCabe sales manager of Bouvier Envelopes Ltd.

Amer. Box Board Names VPs

Promotion of three executives to senior vice presidencies has been announced by American Box Board Co., Grand Rapids, Mich.

Moved up from vice presidents were Gordon B. Bonfield, Robert K. Stolz and Frederick W. Oldenburg.

New vice presidents are Kenneth R. Mull, John L. Wilson and George Diesk.

Continental Can Changes Division Structure

Changes in the structure of Continental Can Co.'s fiber drum and corrugated box division, include merger of the fiber drum and corrugated box sales organizations under newly-appointed general sales manager C. U. Harvey.

Mr. Harvey, in his newly-created post, has announced the following appointments: Harold M. Walter, sales manager, fiber drums; James W. Mesman, sales manager, corrugated boxes; Raymond J. Kautz, manager of sales planning, and A. B. Winterer, manager of customer service and box development.

Reorganization of the division and the merger of its fiber drum and corrugated box sales facilities carried to the district level. The Reading, Pa., fiber drum plant and the New York and Philadelphia fiber drum sales offices were combined with the northeastern corrugated box district, forming a new district to be known as the "Eastern District." G. W. Olson has been named general manager and G. H. Scott assistant general manager of the district.

The Midland, Michigan, Tonawanda, New York and Van Wert, Ohio, fiber drum plants and sales offices, and the Chicago district sales office have been merged with the Plymouth, Mich., Cleveland and Buffalo corrugated box operations to compose a "Central District." Robert Groner Jr. has been appointed general manager of the district and D. S. Thompson, assistant general manager.

Another new district to be known as the "Western District" has been created to cover Continental's fiber drum and corrugated box operations on the Pacific Coast with R. F. Blaum as general manager, headquartered in San Francisco.

Completing the reorganization, the St. Louis fiber drum plant and sales office have been added to the Southern district with L. B. Pitts continuing as general manager.

Warder Box Buys Ranburn

Ranburn Co. Inc., Tonawanda, N. Y., box manufacturers, has been purchased by the Warder Paper Box Co. Inc. of Niagara Falls in a cash transaction.

George K. Boyer, president of Warder, said all key personnel of Ranburn will be employed by Warder. The Falls firm also is buying a major part of the equipment of the 39-year old company.

Henry L. Burns, president and treasurer of Ranburn, will handle sales in the combined operations and Carl A. Wagner, Ranburn vice president, will work on production.

The Ranburn Co. was incorporated in 1919 and the present owners acquired the control of the firm in 1934. The Warder Co. started operations in 1898 as the Hinds Paper Works in Oneida. In 1934, it merged with the Warder Paper Box Co. of Dunkirk and the combined firm moved to Niagara Falls.

The Tonawanda plant, employing about 40 workers, will be closed in two weeks and operations transferred to the Warder plant. The Tonawanda plant will be put up for sale or lease.

Ft. Wayne Corrugated Appoints Timmer

Leonard Timmer has been appointed quality control engineer for Fort Wayne Corrugated Paper Co. He is a graduate of Western Michigan University's pulp and paper course. Prior to his appointment he was supervisor of Fort Wayne's Central Laboratory in Hartford City, Ind.

U. S. Envelope Fills Manager Posts

Gilbert L. Packer, assistant manager of the United States Envelope Co.'s Southwest Division in Dallas, has been named manager of that division. He succeeds Evert M. Anderson who has been appointed manager of the company's Los Angeles Division.

Paramount Buys Div. of Container Corp.

Paramount Packaging Corp., Philadelphia, acquired the Flexible Packaging Division of Container Corp. of America, Chicago, Ill., as part of their 30th anniversary expansion and modernization program.

Plant No. 3, the new Chicago Division of Paramount Packaging, will be under the general management of Irvin Isen, vice president and Joseph Gauss, sales manager, along with former Container Corp. personnel.

W. S. Schweinfurth

W. Francis Hudson

W. V. Sales Managers

Transfer of one district sales manager and the appointment of a second for Hinde & Dauch division of West Virginia Pulp and Paper Co. has been announced by John B. Wyatt, division vice president. Willard S. Schweinfurth formerly Buffalo district sales manager, has moved to the same position at H&D's Gloucester City, N. J. factory.

W. Francis Hudson, who becomes sales manager for the Buffalo district, has been with Hinde & Dauch since 1949. He has worked as a package engineer in the Richmond, Va. territory prior to moving to Buffalo.

Diem & Wing Elect New President

Edwin W. Wesselmann, vice president of the Deim & Wing Paper Co., Cincinnati, Ohio, was recently elected president of the firm, succeeding Paul A. Stuhlreyer, who died in November.

Other officers named were John H. Schneider, former secretary, vice president; Paul A. Stuhlreyer Jr., advanced from assistant secretary to secretary, and William F. Roemler, re-elected treasurer. O. D. Roemler was named assistant treasurer. The officers and Clarence C. Meyers, Walter H. Joos and Thomas J. Clancy make up the board of directors.

Allied Building New Corrugated Plant

A new 200,000 sq. ft., corrugated box plant being built at Dedham, Mass., for the Allied Container Corp. is scheduled for completion in the spring, according to the New England Council.

In the multi-million dollar facility will be installed the largest corrugator in New England—a machine capable of producing corrugated board in 96-inch widths at speeds up to 750 feet a minute.

Highlights of the new structure include a completely enclosed railroad siding for 14 freight cars, enclosed platforms with adjustable ramps for 16 trucks, employee cafeteria, and air conditioned offices.

Mead-Atlanta Promotion

Mead-Atlanta Paper Co. has announced the promotion of James B. Young to sales manager of the Atlanta metropolitan area. Mr. Young, currently serving as assistant director of national sales for Cluster-Pak, folding box and beer cartons, will head the company's Atlanta folding box sales.

Jeannette & Sterling Firms Consolidate

Jeannette Box Co. has combined operations with Sterling Box Co of Homestead, Pa.

New name of the firm will be Sterling-Jeannette Box, and the plant will be on Thomas Ave., in Columbus.

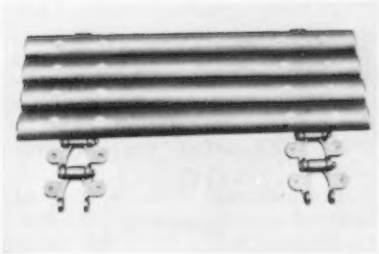
Jeannette Box now has facilities on Thomas Avenue totaling 80,000 sq. ft. on about five acres leased from J. H. Millstein. The new firm purchased this and the rest of the original Semler tract of 10½ acres to permit expansion of the present plant. It is the aim of the new firm to have eventually 150,000 to 175,000 sq. ft. on one floor under roof.

Sterling-Jeannette Box will combine equipment to provide the modern set-up and folding machinery. Jeannette Box manufactured set-up boxes. Sterling will move its folding equipment to Jeannette.

* * *

Almost one-third of the paper and paperboard used in the United States is returned to the paper mill in the form of waste paper and used again.

NEW EQUIPMENT AND SUPPLIES



Slatted Conveyor Apron

An all steel, chain slat, conveyor apron was recently put on the market by Robert A. Main & Sons Inc., 257 Pascack Road, Paramus, N. J. Steel slats are mounted on forged steel, heat treated, chain links, measuring eight slats per foot. The heat treated chain is suitable for long hard wear and shock resistant duty. Robert A. Main & Sons Inc. manufacture slatted conveyors using single or multiple strands of chain for any width or length slatted apron, using wood, plastic or metal slats.

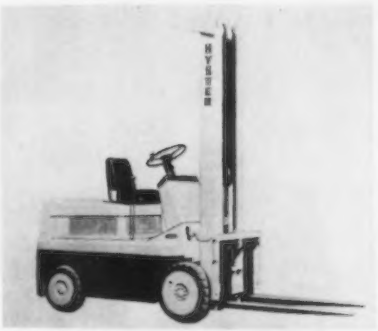
Portable Pyrometer Checks Temperature Instruments

With the addition of four new interchangeable special scales, the Pyrotest portable potentiometer pyrometer can now be used to check and calibrate

temperature instruments actuated by any one of ten types of thermocouples. This makes the Pyrotest essentially ten instruments in one. It may now be used to check any thermocouple-actuated temperature recorder, indicator or controller operating within a range of 32°F. and 3215°F. It also measures d.c. potentials from 0 to 155 millivolts.

Each scale is photo-etched on an aluminum disc that may be removed and replaced without tools in 30 seconds. Temperatures or millivolts are read directly, without charts, graphs or conversion tables.

Other new features include leatherette case, collet-action driving knob, and improved hardware.



Design Advances in Lift Trucks

An entirely new line of 6000, 7000 and 8000 pound capacity lift trucks said to forecast advance design trends in cushion tired machines has been announced by Hyster Co.

The new Space Saver line is available with power shift transmission as optional equipment, which is claimed to provide a new standard of driving ease and eliminate the conventional clutch pedal arrangement found on most lift trucks. Shifting from forward to reverse, or vice versa, is accomplished simply by moving the hand lever on the steering column to the appropriate position. Since this can be done while the vehicle is in motion, cycling speeds are substantially shortened when the trucks are operated within a relatively small or confined area.

The short over-all length of the new Space Saver trucks combined with long wheelbase, provides the right weight distribution for superior traction and steering. High underclearance at the center of the vehicle prevents hang-up on steep ramps or rough terrain. Power steering as standard equipment and extremely short turning radius insures that the truck can be used in plants, warehouses and service buildings having narrow aisles and restricted space for manipulation. Powered with a customized 70 h.p. high torque engine built by Continental, this new series will more than meet the severe requirements of lift truck operations.

Additional information can be obtained by writing to Hyster Co., 1003 Myers Street, Danville, Ill.

Pyramided Ladders Provide Safety

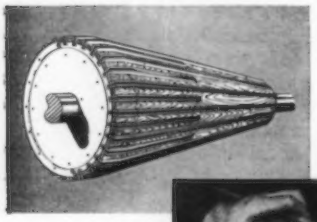
The new pyramid design has been added to Ballymore's 8 to 12-step "Hi-boy" ladders. This additional safety factor provides greater stability which increases the feeling of security for those using the ladder. It encourages better, quicker work at heights up to 15 feet . . . has resulted in immediate savings in time and efficiency.

All-steel welded construction assures superior, long-lasting strength. All models are equipped with handrails and with four 4-inch-diameter casters for mobility. Widths at bottom are 30 inches, tapering to 25½ inches at top step. Treads of expanded metal, serrated anti-skid grating or ribbed rubber are available.

For further information on these ladders write to the Ballymore Co., West Chester, Pa.

TIME FOR REPLACEMENT?

E.D. Jones® Adapta-Plug



Strongest plug design yet developed, this new completely bandless Jordan plug is easiest to strip and fill. New, improved design holds bars firmly in place, eliminates hazards of slot wear and corrosion. Available in solid plug — or sleeve form for easy conversion of old worn plugs. Write for Bulletin EDJ-1094.

E.D. Jones®

FULBAR

SHELL FILLINGS

A complete one-piece assembly, made to fit the shell body of any Jordan. No keys or wedges. Fulbar rigidity and one-piece construction compensate for inequalities in old Jordan shells — save hours of installation time. Many other new advantages make this the ideal shell filling. Write for Bulletin EDJ-1094 and names of satisfied users.

E. D. JONES & SONS COMPANY
Pittsfield, Massachusetts

Builders of Quality Stock Preparation Machinery

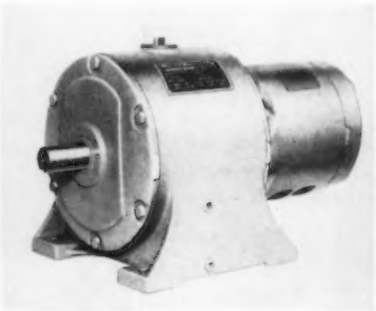
In Canada: The Alexander Fleck, Ltd., Ottawa

New Packings Color Coded

A new line of color coded mechanical packings for chemical processes has been introduced by the A. W. Chesterton Co. Their color coding provides positive service identification, prevents mix-ups and simplifies inventories.

Three styles of Chesterton packing cover the full pH scale. For sealing strongest acids, (pH 1 to 4) a blue packing is used; for sealing mild acids and mild alkalies, (pH 5 to 7) a black, graphited, braided asbestos packing is utilized. This economical packing provides trouble-free service against mild chemicals; for sealing strong caustics and other alkalies (pH 8 to 14) there is a white packing.

A fourth Chesterton Packing "Super-Lon" is brown color coded and can be used over the entire pH scale from sulphuric acid to sodium hydroxide. It is woven of 100 per cent filament Teflon yarn. A brochure giving full information is available on request to A. W. Chesterton Co., 6 Ashland St., Everett 49, Mass.



New Gearmotor Line Announced

Western Gear Corp. announces the design, manufacture and marketing of its line of StraitLine integral and all-motor gearmotors ranging from 1 to 60 h.p. and from 9 to 520 r.p.m.

Important features of the gearmotors are interchangeability of gear sets and motor packages in the field without disconnecting the gearmotor from its foundation or the driven shaft, changing of ratio in the field, quickly and simply, when output speed variation requirements arise; easier servicing in the field because gear housings are accessible from either end; flexible inventory through the "building block" system of parts standardization.

For Bulletin 5806 write General Offices, Western Gear Corp., P.O. Box 182, Lynwood, Calif.

OBITUARIES

Cliff R. Crawford, 68, vice chairman of the board of Black-Clawson Co., died suddenly on January 31 in Hartsville, S. C. He had arrived in Hartsville on a business trip from his office at the Miami Valley operations of Black-Clawson, Middletown, Ohio.

Mr. Crawford began his career in 1909 with the Shartle Bros. Machine Co., Middletown. At the time Shartle Bros. merged with Black-Clawson in 1926, Mr. Crawford was chief engineer.

He subsequently served as vice president and general manager of the Shartle Division, and in 1951 was elected president of Black-Clawson. In September of 1957 Mr. Crawford resigned as president and was elected vice chairman of the board.

George F. Moxley, retired president of the West Jersey Paper Manufacturing Co., Camden, N. J., died January 27 at his home in Largo, Fla. Mr. Moxley retired in 1951 to make his home in the South.

William Kendall Rothfuss, 59, president of the Decorators Wall Paper Co., St. Louis, Mo., died of cancer January 15 at St. John's Hospital. An employee of the firm since 1926, he became president about 12 years ago.

Ross H. Roadhouse, 71, president of General Paper Stock Co., a division of the Alton Box Board Co., died January 20 in the Rest Haven Rest Home at Toledo, Ohio.

Raymond H. Nicholas, 59, production department supervisor at the Downing Box Co., Milwaukee, died January 27 of a heart ailment.

Raymond A. Richards, 68, a vice president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, died January 29 at Wisconsin Rapids, Wis. He represented the union in Wisconsin, Minnesota and Michigan.

Carrol L. Wilson, director of finance of the Champion Paper and Fiber Co., died January 30 of a heart attack at his home.

He was a former director of the Bureau of Foreign and Domestic Commerce in the U. S. Commerce Dept. and helped organize the Committee for Economy Development. In 1955, Wilson served on a U. S. Trade Mission to Austria.

In casein or starch formulations . . .

GEN·FLO 62

is tops in paper coating

Gen-Flo, General Tire's high-quality styrene-butadiene latex, has been extensively tested by leading paper manufacturers, and found outstanding for paper coating applications. Entirely compatible with presently used latices, Gen-Flo also offers extremely low odor at no premium in price. Whether your operation calls for starch or casein formulations, Gen-Flo fits perfectly, and offers many advantages:

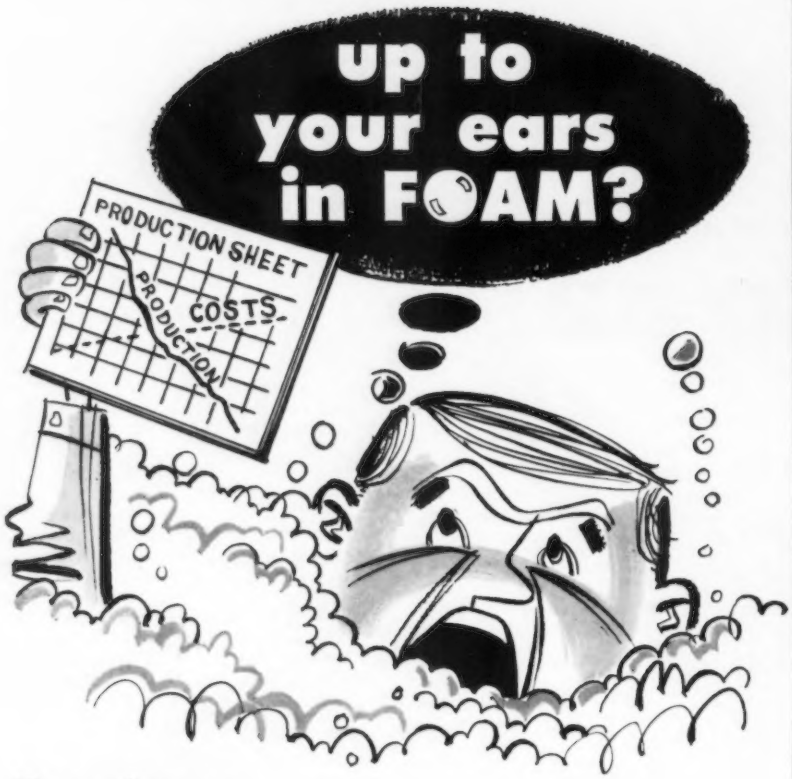
Superior brightness
Better pick resistance
Higher ink receptivity
Improved opacity
Better smoothness and gloss

Write today for complete product information, and details on how Gen-Flo 62 can improve your paper-coating system and save you money.

Creating Progress Through Chemistry

Chemical Division
GENERAL
THE GENERAL TIRE & RUBBER CO.
GEN-FLO®

THE GENERAL TIRE & RUBBER COMPANY
CHEMICAL DIVISION AKRON, OHIO



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1 OUNCE KILLS FOAM IN:

6,250 lb
Paper Color Coating
Paper Size

1,250 lb
Printing Ink

62,500 lb
Black Liquor
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NAME _____

TITLE _____

COMPANY _____

CITY _____ ZONE _____ STATE _____

My foamer is

Oil system _____

Aqueous system _____

Other _____

NEWS OF SUPPLIERS

E. M. Rhodes

F. G. Syburg

G. A. Evans

Chain Belt Co. has elected as directors, E. M. Rhodes, vice president—Chain Belt Industrial Equipment Section, and C. E. Wampler, president and a director of the Wisconsin Telephone Co. They were elected to fill vacancies created by the retirement of R. W. Baird and E. L. Wood who were not standing for reelection in accordance with the current director retirement policy of the company.

Frederic G. Syburg was appointed vice president—purchasing and George A. Evans, secretary of the company. All other present officers were re-elected.

Dow Chemical Co. announces the opening of a new sales office in Dallas, Texas, in the Dallas Federal Building, 1505 Elm St. Donald P. Camp, former head of chemicals sales with the company's Houston office, has been appointed manager.

Western Gear Corp.'s San Francisco Bay area operations will be concentrated at the company's Belmont works. The old San Francisco plant, which offered no possibilities for expansion, and all personnel are being transferred to Belmont.

Allis-Chalmers has named Frank R. Pletz an assistant application engineer in the pulp, paper and general processes section of its electrical application department.

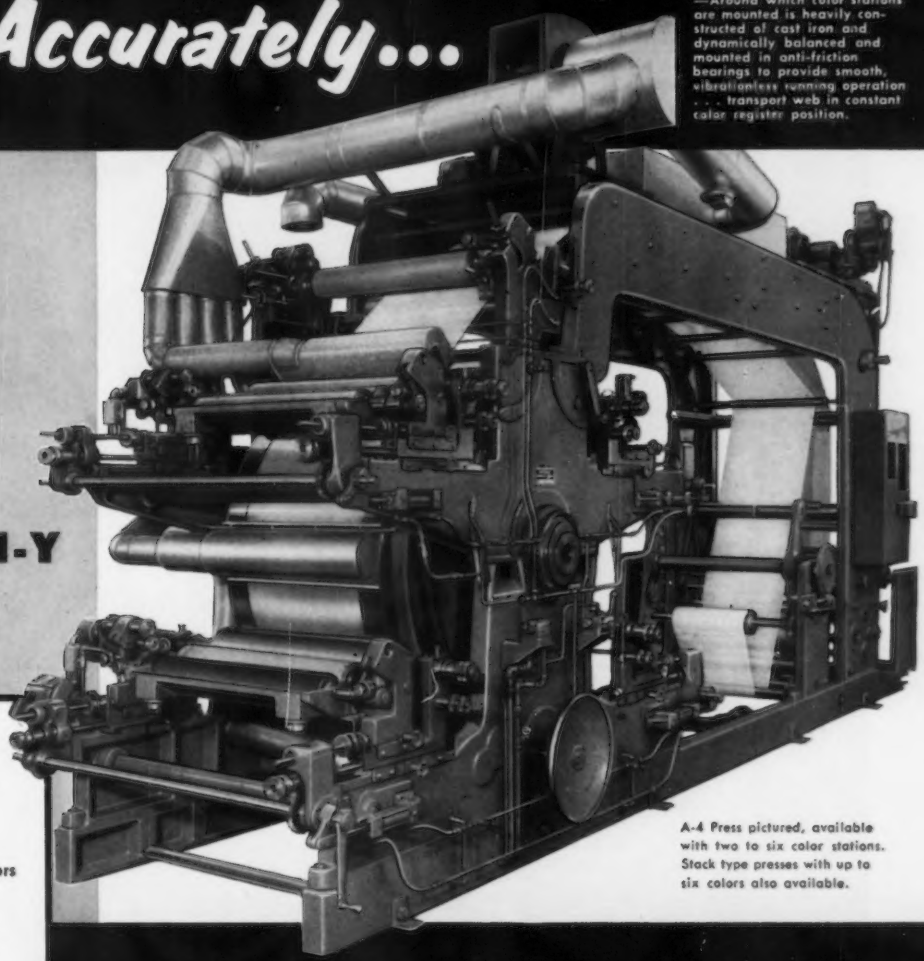
(Continued on page 64)

Register Accurately...

Single Impression Cylinder

—Around which color stations are mounted is heavily constructed of cast iron and dynamically balanced and mounted in anti-friction bearings to provide smooth, vibrationless running operation . . . transport web in constant color register position.

Highly detailed screen or line COLOR PRINTING ON S-T-R-E-T-C-H-Y FILMS



A-4 Press pictured, available with two to six color stations. Stack type presses with up to six colors also available.

Check carefully these important advantages:

- High speed printing up to 1000 ft. per minute
- Standard presses with two to six colors
- Prints 20" to 50" widths, repeats 12" to 36"
- Continuously agitated splush-proof ink fountains
- Hydraulic color throw-outs
- Prints 1 mil. film to heavy weight papers
- Anilox type transfer rolls
- Automatic tension web controls for accurate print register and repeats
- Constant print repeats increase operating efficiency of automatic bag and packaging machines
- Handles unevenly wound rolls or webs of varying caliper
- High speed surface driers of advanced design between colors and before rewinding
- Flying splice unwind and rewind for continuous operation, optional
- Vibrationless, heavy duty cast iron construction
- Anti-friction bearings thru-out
- Easiest of all presses to operate—holds register at all speeds
- Reduces down-time and material waste to the minimum

Constant register FLEXO-PRESS prints two to six colors with hairline accuracy on all types of packaging films, foils, papers and heavy-duty wraps

High speed color printing of the finest quality on Polyethylene, Pliofilm, Mylar, Saran and other materials is greatly simplified with this modern press.

Holding *color impressions in accurate register* and *print repeats* over long runs is no problem. Once set, this press holds register at all speeds without readjustment. Web *locks-in* position on a single impression cylinder and is transported from color to color *without stretch or expansion.* Measured tension controls on both infeed and outfeed regulate stretch and keep repeats in constant register — even though roll may be unevenly wound or web of varying caliper. Prints materials of variable thickness from 1 mil. films to heavy weight papers.

Heavy duty, cast iron construction assures years of trouble-free service and smooth, vibrationless running operation even with the hardest of usage. Users acclaim our A-4 press as the easiest to operate—the most economical in down-time and material waste. Write us — we'd like to discuss its many advantages with you.

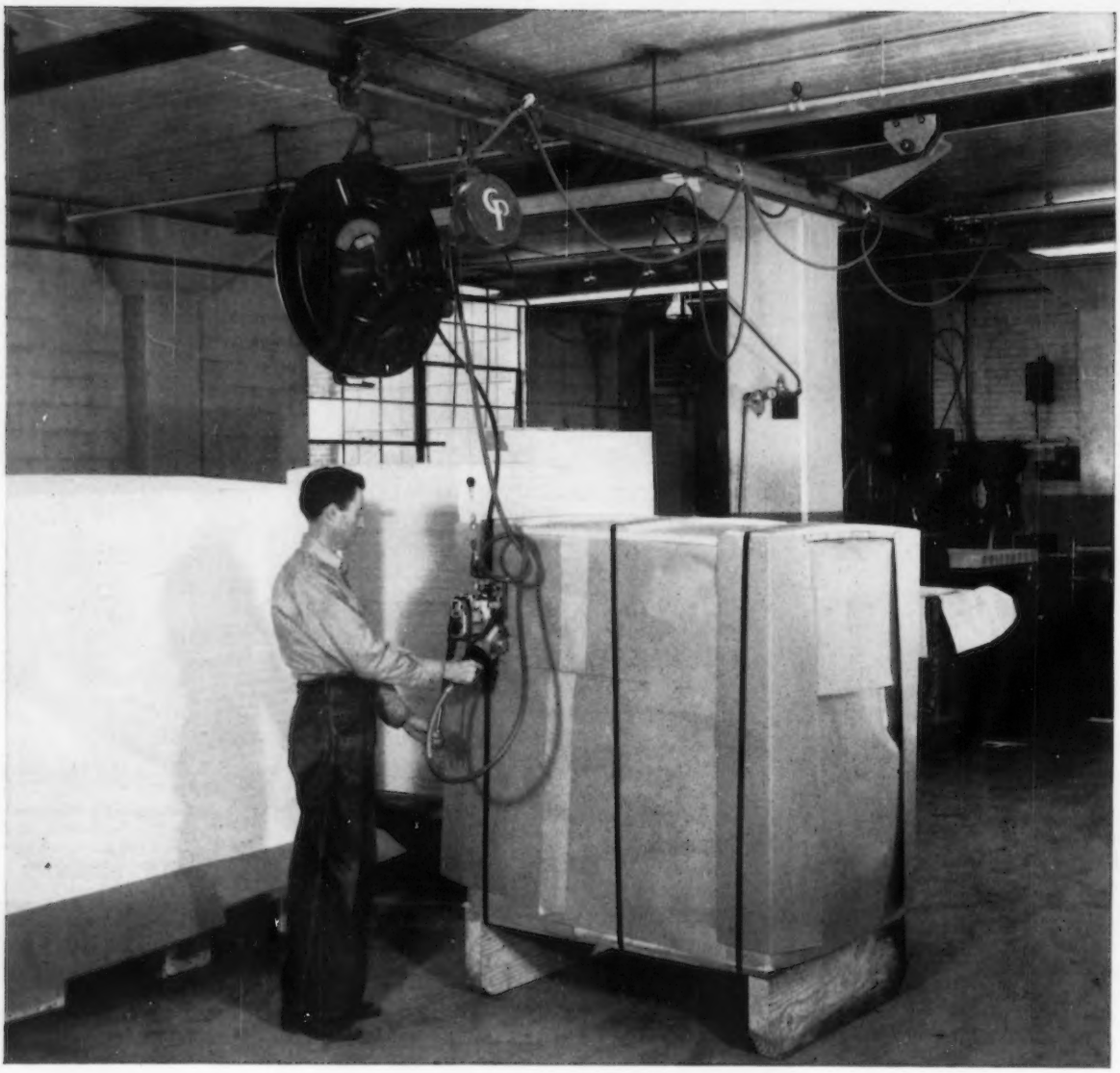
Other Hudson Sharp machines include Roto and oil ink presses, Automatic Roll Winders, Waxers, Embossers, Laminators, Folders, Core Winders, Crepers and Campbell Wrappers.

CONVERTING AND PRINTING EQUIPMENT

HUDSON-SHARP MACHINE CO.

GREEN BAY, WISCONSIN

SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION



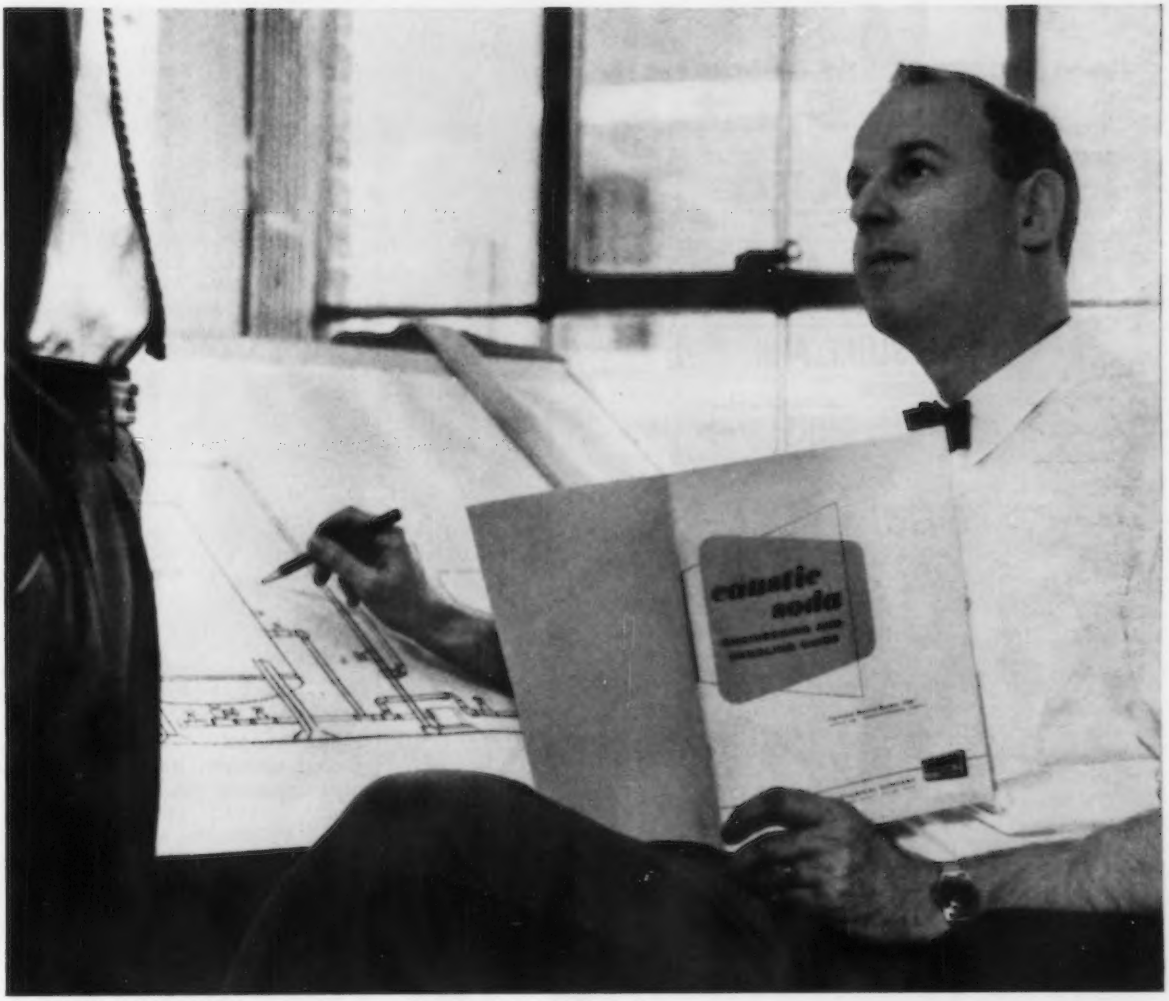
Fast new way to strap paper skids

Strapping paper skids is fast and easy with a setup like this. The bridge crane gives mobility to the strapping equipment, and obstruction-free working space on the floor. Signode's new AP-34 air-powered strapping machine applies strap almost effortlessly, in seconds. This Signode design setup makes skid strapping a much more efficient and easy operation. It saves important time and, in addition, frees valuable floor space. A Signode field engineer will be glad to work with you to develop complete strapping stations in your plant, tailored to your needs. Let him help you save time and money now. Write:

SIGNODE STEEL STRAPPING CO.

2677 No. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto



NEW HOOKER MANUAL helps you store and handle caustic soda safely

This new manual gives you 40 pages of information and advice on how to handle and store liquid caustic soda safely, efficiently, and with minimum risk of contamination.

Here are some of the contents:

- ✓ Large, detailed diagrams of equipment to use in unloading, diluting and storing.
- ✓ Commonly used methods for unloading a tank car of liquid caustic soda, for diluting to different strengths, and for storing.
- ✓ A section on safety precautions and first aid.
- ✓ A section on materials of construction.
- ✓ 18 charts, graphs and tables to help you predict and control the behavior of liquid caustic under a wide range of operating conditions. These cover such properties as dilution temperature, vapor pressure, viscosity, specific heat, etc.

For your copy of this new manual write us today or use the coupon.

HOOKER CHEMICALS PLASTICS

665W18

HOOKER ELECTROCHEMICAL COMPANY
1802 FORTY-SEVENTH STREET, NIAGARA FALLS, N. Y.

Niagara Falls Tacoma Montague, Mich. New York Chicago
Los Angeles Philadelphia Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B. C.

HOOKER ELECTROCHEMICAL COMPANY
1802 Forty-seventh Street, Niagara Falls, N. Y.

Please send me a copy of Bulletin 102, Caustic Soda Engineering and Handling Guide.

NAME.....

TITLE.....

COMPANY.....

STREET.....

CITY..... STATE.....

Looking for **CHLORINE?**

Go Diamond

DIAMOND's five conveniently located plants can back you up with emergency or regular shipments. Simply call the nearest DIAMOND sales office. We're ready to make fast deliveries. We'll gladly give you technical help, too, on any chlorine problem. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

CHLORINE PLANTS: Edgewood, Md.—Deer Park, Texas—Muscle Shoals, Alabama—Painesville, Ohio—Pine Bluff, Arkansas.
SALES OFFICES: Cleveland, Cincinnati, Chicago, Houston, Memphis, New York, Philadelphia, Pittsburgh, St. Louis.

(Continued from page 60)

Ebasco Services Inc. has elected as directors J. H. Curtis, W. H. Colquhoun, and E. K. Wilkins. Mr. Curtis is president of Chemical Construction Corp., while Mr. Colquhoun and Mr. Wilkins are vice presidents of Ebasco.

A. M. Lockett & Co., Ltd., sales engineering representatives of Babcock & Wilcox Co.'s boiler division, has moved its Dallas, Tex. district sales office to 1701 Mercantile Dallas Building, 1807 Commerce St., Dallas 1.

T. Agronin

R. S. Bender

Appleton Machine Co. has announced the appointment of two men to executive positions. Tany Agronin has been named executive vice president and general manager. Ray S. Bender has been appointed vice president of the firm.

Mr. Agronin was manager of Black-Clawson Co.'s Brazilian affiliate, Companhia Federal de Fundicao. Previously he served in Black-Clawson's Pandia division in New York City and Hamilton, Ohio, and with the Shartle division in Middletown, Ohio.

In his new position, Mr. Bender will supervise the company's sales force. He succeeds R. M. Radsch who is retiring, but who will remain with the company as a consultant. Since joining the company in 1946, he has been a draftsman and manager of sales engineering.

Allis-Chalmers Industries Group has announced the following appointments:

Dale C. Schulman and John L. Wenning as sales representatives to the Milwaukee and Appleton offices, respectively.

Jerry A. Marrs and David F. Burr sales representatives to the Cleveland and Toledo district offices, respectively.

John E. Garrett and Fred H. Young as sales representatives to the Atlanta and Jacksonville offices, respectively.

Richard G. Broom as sales representative to Allis Chalmers Denver district office.

David D. Penrod and Lewis M. Soars as sales representatives to the Buffalo and Wilkes-Barre districts, respectively.

(Continued on page 78)

MINIMUM MAINTENANCE, LONG LIFE ASSURED BY THESE HEAVY-DUTY "BUFFALO" FANS

"Buffalo" Type "BLH" Fan
For Classes III & IV Service

"Buffalo" Type "BL" Fan
For Classes I & II Service

The high performance characteristics of these two outstanding "Buffalo" Fans has resulted in their widespread use in the field of industrial air handling. In addition to offering peak-efficiency operation in their respective classes, both the "BL" and the "BLH" bring you a bonus economy factor of *maintenance reduced to an absolute minimum* throughout a long, productive life. This minimum maintenance factor is directly due to unusually rugged "Buffalo" construction features such as:

HOUSINGS — The heavy gauge sides and scroll are of all-welded construction. Heavy structural steel bracing provides housing stiffness and rigid bearing support. Flanged inlets and outlets give added support.

SHAFTS — Hot-rolled or forged shafts are ground to close tolerances for perfect wheel and bearing fit.

WHEELS — Sturdy backward-curved blades are welded to the die-formed shroud and welded or riveted to the solid backplate. Heavy hubs assure permanent shaft alignment. For higher tip speeds, reinforcing rings provide necessary wheel rigidity.

BEARINGS — Self-aligning anti-friction bearings are designed for continuous operation at maximum tip speed. Horizontally split, ring-oiled, self-aligning, babbitted sleeve bearings are also available.

For full details, contact your "Buffalo" representative, or write for Bulletins F-102 and F-200.

Minimum maintenance is assured by the famous "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life in every "Buffalo" product.

"Buffalo"

BUFFALO FORGE COMPANY

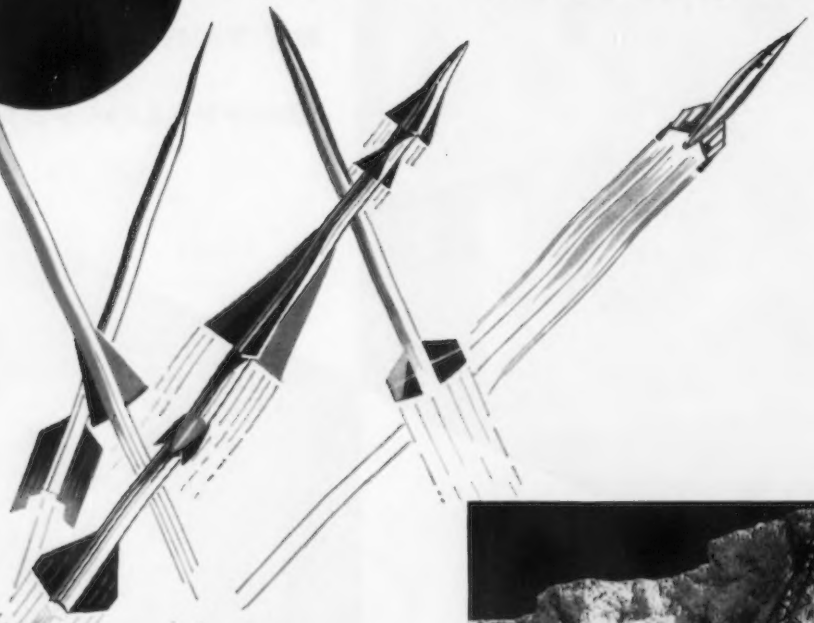
159 Mortimer Street • Buffalo, N. Y.

BUFFALO PUMPS DIVISION, BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

SULPHUR *helps to create* **HEADLINE** *products*



BORANES

The latest word in rocket and missile fuels!

This combination of Boron as the active oxidizable ingredient and hydrogen peroxide as the powerful oxidizing agent is proving to be one of the most powerful propellent fuels yet developed. The mixture is called BORANE.

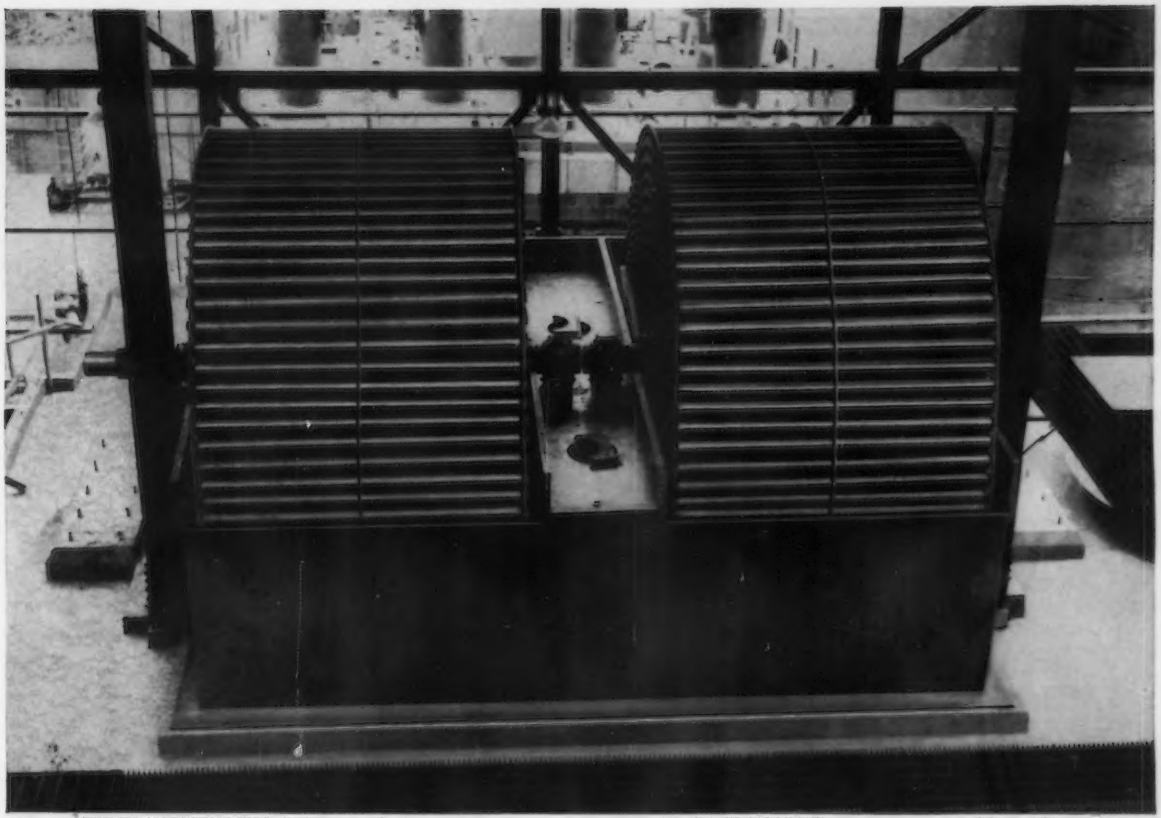
Both Boranes and Hydrogen Peroxide owe their existence to Sulphuric Acid, the important reaction chemical in changing borax into boric acid from which the Boranes are derived. Sulphuric Acid also is the starting point in the production of hydrogen peroxide.

It is difficult to find any commodity stemming from chemicals, either organic or inorganic, that doesn't meet up with Sulphur or a derivative somewhere along the line. Quite often the Sulphur radical appears in the chemical structure of the commodity itself. Many, many times it plays an important role in the production of the headline product . . . just as in the case of the BORANES.

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.
811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units
- Newgulf, Texas
- Moss Bluff, Texas
- Spindletop, Texas
- Worland, Wyoming



NEWS ABOUT THE CASCADE EVAPORATOR

The most widely used direct contact evaporator for pulp mill black liquor recovery units

C-E now has exclusive sales and manufacturing rights to the Tubular Cascade Evaporator. Long favored in pulp mill practice, there are more than 120 recovery units, in service or on order, that use this unit. This represents a very substantial percentage of all the direct contact evaporator capacity purchased by the industry.

This overwhelming preference is due, in large measure, to the inherent advantages of this unit. These are:—

HIGHEST liquor concentration

lowest power input

HIGHEST availability

lowest maintenance

HIGHEST efficiency

lowest chemical losses

In addition, the unit is self cleaning and offers maximum degree of flexibility. That these advantages are real is evidenced by the fact that of the total number of Cascade Evaporators sold, more than 50% represent repeat orders.

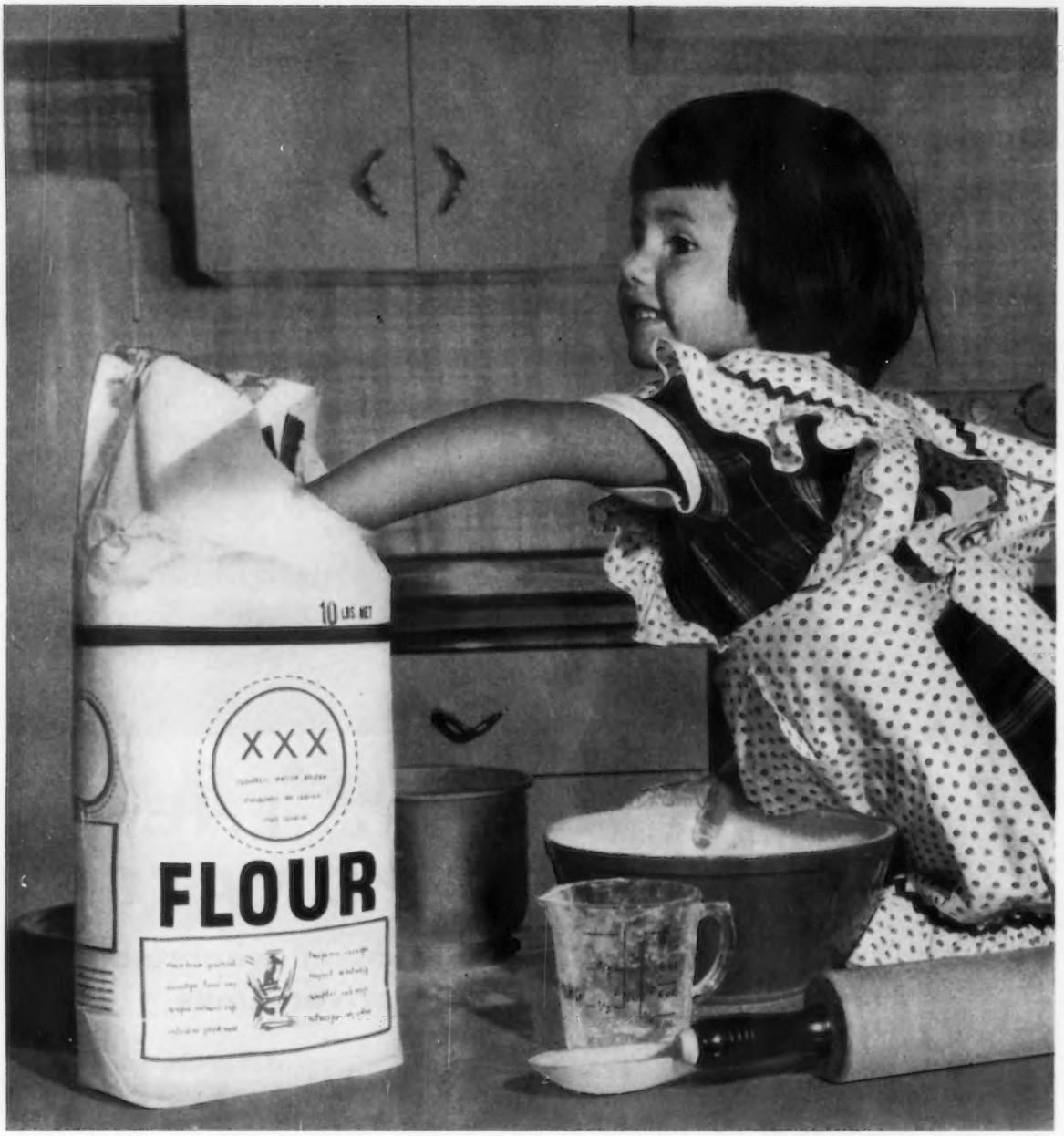
C-E will welcome your inquiry concerning the Cascade Evaporator —whether it be for use with a new recovery unit or for an existing installation. For more information, contact our Paper Mill Division.

COMBUSTION ENGINEERING

Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y.

C-137

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING EQUIPMENT; PRESSURE VESSELS; SOIL PIPE



TITANOX*... it's in the bag

While our young baker has the spirit, we don't guarantee the results. But we can guarantee that nothing surpasses TITANOX titanium dioxide white pigments for imparting the bright whiteness to paper that makes the flour bag a shining promise of purity within.

Not only for paper for white bags but for any type of paper that needs whitening, brightening and opacifying, TITANOX is No. 1 choice in white pigments. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y. Offices in principal cities.

TITANIUM PIGMENT CORPORATION

Subsidiary of **NATIONAL LEAD COMPANY**

*TITANOX is a registered trade mark for the full line of titanium pigments offered by Titanium Pigment Corporation.

5208

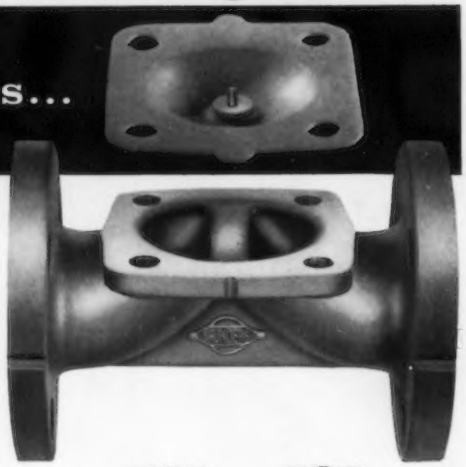
HAMMERMILL NO. 6
now a
"Papermaker's Dream"
MODERNIZED BY
VALLEY
Hammermill's No. 6 paper machine is now in full operation, after a complete modernization of the wet end which includes:
New Valley Inlet and Headbox
New Valley Fourdrinier
New Valley Press Section
New Valley Paper Markers
New Valley Rope Carrier System
New Valley Dryers (four)
This rebuilt machine has already proved itself a "paper maker's dream turning out top quality Hammermill papers." Improvements include better weight control, higher speed capacity, faster wire changes, greater drying capacity, and many other advantages.
This is another link in Valley's long chain of experience in building higher profit potential into America's paper machines. May we put this experience to work for you? Write –
VALLEY IRON WORKS COMPANY APPLETON, WISCONSIN
Canadian Representatives:
Pulp & Paper Mill Accessories Ltd., P.O. Box 903, Station "O" Montreal 9, Quebec

Outperforms other valves under SEVERE chemical conditions

GRINNELL-SAUNDERS DIAPHRAGM VALVES

Backing Cushion

with TEFLON Diaphragms...

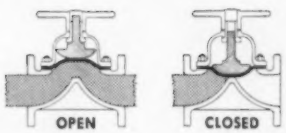


Grinnell Teflon Diaphragms are made by a special process which produces a better product of greater density, toughness and flex life.

The four case histories cited below demonstrate that Teflon offers a very high degree of chemical inertness to some of the most difficult chemicals which industry today must handle. Yet these are only a few of many success stories in the Grinnell files.

Diaphragm life depends on temperature, pressure and frequency of operation. Inquiries must include complete service data to receive prompt and careful attention.

Service Conditions	Saunders Valve Now Used	Service Life: Teflon Diaphragm	Service Life: Previous Valve
Case 1. Benzene hexachloride (30%-40% benzene, free chlorine); 120 to 130 F, 10 to 20 psi; operated 3 to 4 times daily	Glass lined bodies; Teflon Diaphragm; 1 to 3 inches	10 to 14 mos.	1 to 2 mos.
Case 2. 90%-95% HNO_3 plus 1.8% HF (specific gravity 1.62—1.77) 115 F in summer; 40 F in winter; 125 psi; operated 2 to 3 times daily	Durimet 20 body; Teflon Diaphragm; 1 to 3 inches	8 months	2 months
Case 3. $AlCl_3$ complex; ambient to 220 F; 0-50 psi; operated 1 to 2 times daily	Glass lined bodies; Teflon Diaphragms; 1 to 4 inches	9 months	6 months
Case 4. Sulphuric acid 85%; outside temperature; no pressure; operated 4 times daily	Iron bodies; Teflon Diaphragms; 2½ inches	Still in service after 1 year	3 weeks



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Features of Grinnell-Saunders Diaphragm Valves

- Diaphragm lifts high for streamline flow in either direction.
- Body, linings and diaphragm materials to suit service conditions.
- Resilient diaphragm assures positive, leak-tight closure even with grit or scale in the line.
- Diaphragm absolutely isolates working parts from fluid . . . sticking, clogging, contamination, corrosion eliminated.
- Simple maintenance. Diaphragm can be replaced easily without removing valve from the line. No packing glands to demand attention. No metal-to-metal seats to become damaged or wire-drawn.

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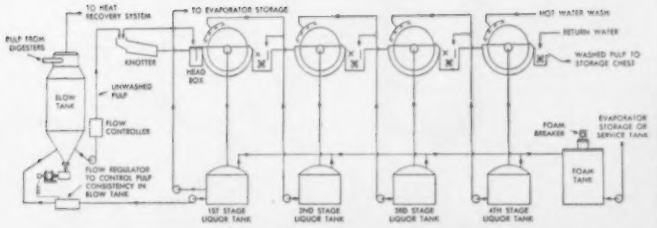
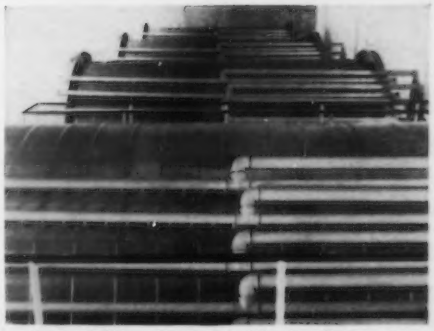
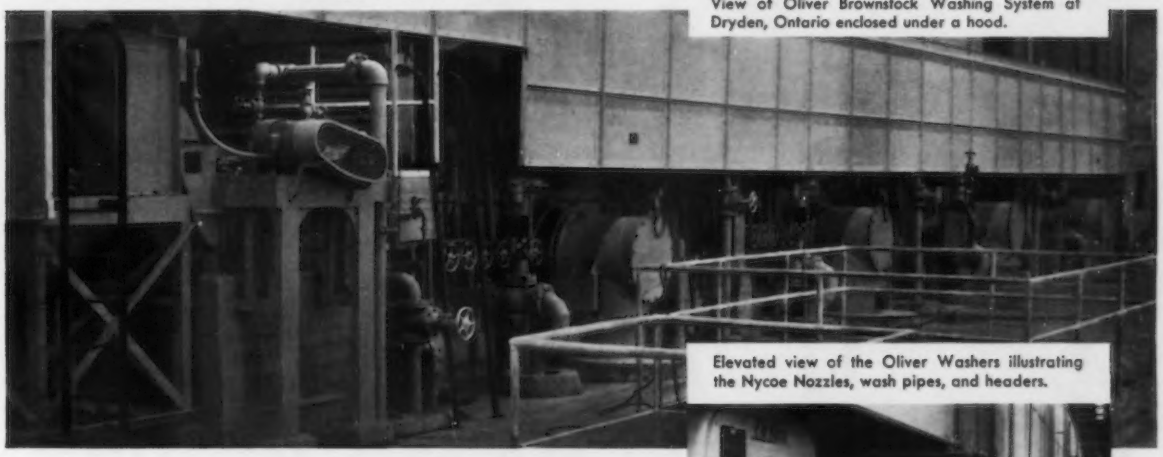


The four stage Oliver Brownstock Washing System with four Washers, similar to that employed at Dryden Paper Company Limited. All of the major equipment units in the Brownstock Washing Flowsheet are supplied by Dorr-Oliver.



View of Oliver Brownstock Washing System at Dryden, Ontario enclosed under a hood.



Elevated view of the Oliver Washers illustrating the Nycoe Nozzles, wash pipes, and headers.

Drive end view of the four 55F9 Oliver Cone Valve Washers at Dryden. Note the rugged cast iron washer drive in the center foreground.

Another Complete Dorr-Oliver System

for Dryden Paper Company Limited

. . . New 300 ton 4 stage Oliver Brownstock Washing System with adjoining Dorr Continuous Recausticizing System at Dryden, Ontario Mill.

In full operation after a March 1957 start-up, this 300 ton 4 stage Oliver Brownstock Washing System plays an important role in Dryden Paper Company's multi-million dollar expansion program. With the Dorr Continuous Recausticizing System in the new Dryden, Ontario mill, the Oliver Brownstock Washing System produces bleached northern kraft pulp, while outside temperatures occasionally drop to minus 48°F.

In the heart of the Oliver Brownstock Washing System are four, 11'6" dia. x 16' face, 55F9 Oliver cone valve washers; each with a hydraulic capacity of over 10,000 gpm.

At Dryden, where the annual capacity is anticipated at 142,000 tons, additional Dorr-Oliver pulp and paper equipment includes an Oliver Sheet Former and an Oliver Valveless Decker.

For more complete information on the Oliver Brownstock Washing System write for a copy of Bulletin No. 3303, Dorr-Oliver Incorporated, Stamford, Connecticut; or better still let us send a Dorr-Oliver engineer to discuss your specific filtration or washing problem with you, placing at your disposal the wealth of information accumulated through our 35 years of Brownstock Washing experience.

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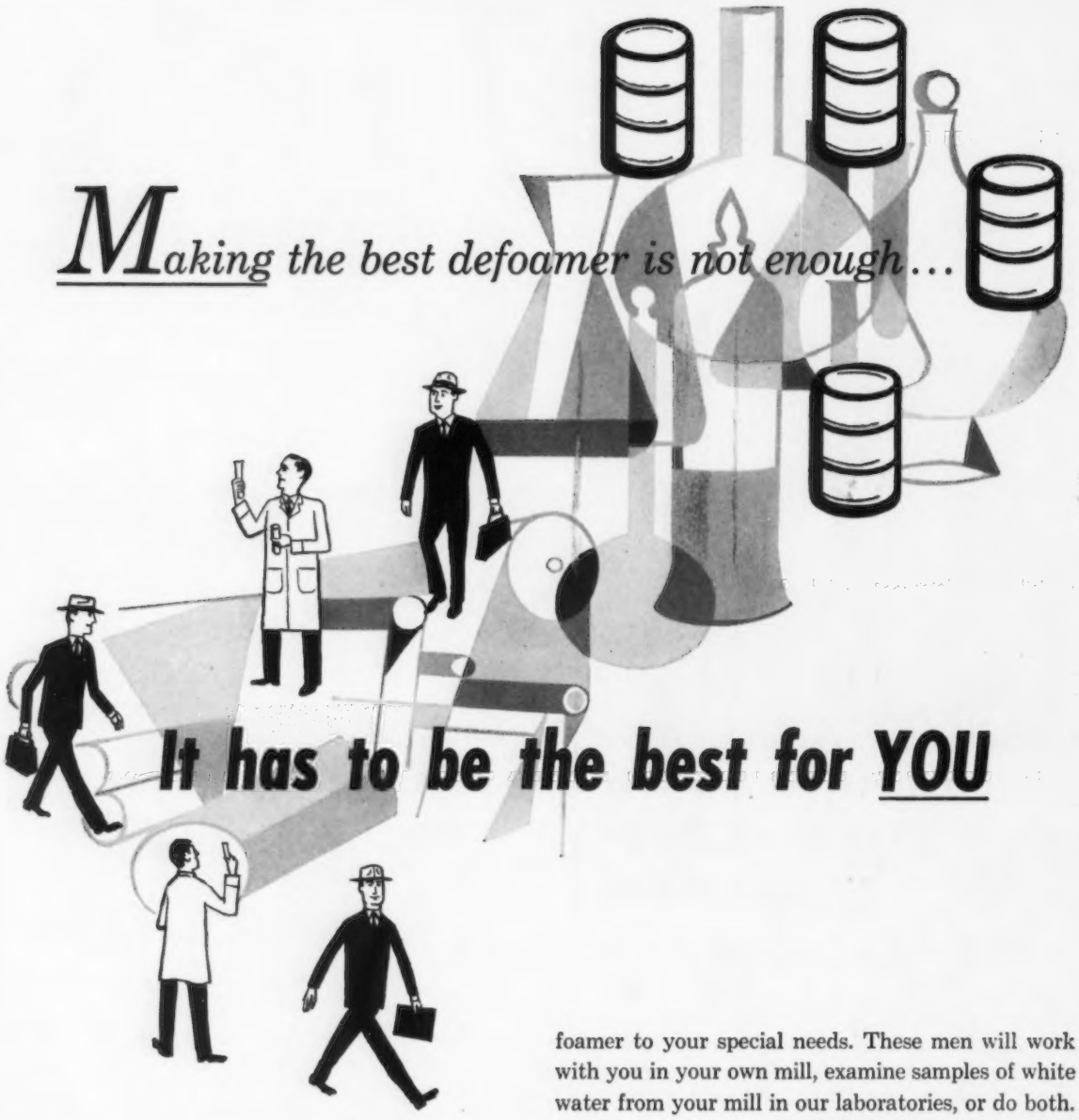

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Every paper mill must control foam—with the greatest possible efficiency—at the lowest possible cost. And since each mill differs so widely from every other mill, Nopco's Paper Division spares no effort to make certain we have a defoamer—whether paste, liquid, or flake—that will effectively, economically control foam in *your* mill.

But making the best defoamers is not enough. Nopco's technical staff has the breadth of experience that can be invaluable to you in fitting the right defoamer to your special needs. These men will work with you in your own mill, examine samples of white water from your mill in our laboratories, or do both.

You can't be sure you've attained *maximum defoaming efficiency at the lowest cost per ton* until you have the best "team" in the business, the Nopco technicians, prescribe from the widest range of defoamers in the business—the Nopco defoamers. Write today for a free booklet on Nopco defoamers. Nopco Chemical Company, Harrison, New Jersey.

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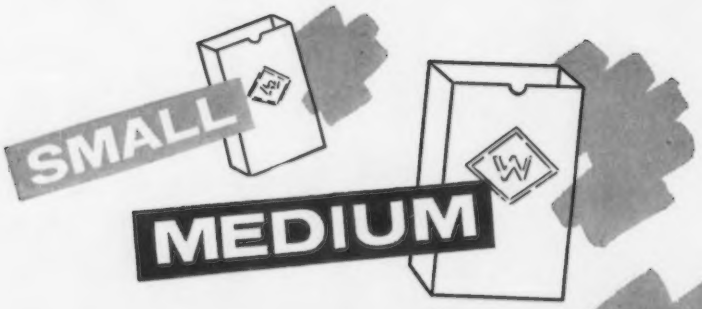

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Potdevin machines are versatile. Some can produce satchel-bottom bags as well as LARGE self-opening-square specialty bags. All machines are or can be equipped with aniline press drives, pneumatic feed rollers, pneumatic mill roll lifters, rotary cut-offs and Farval lubrication systems.

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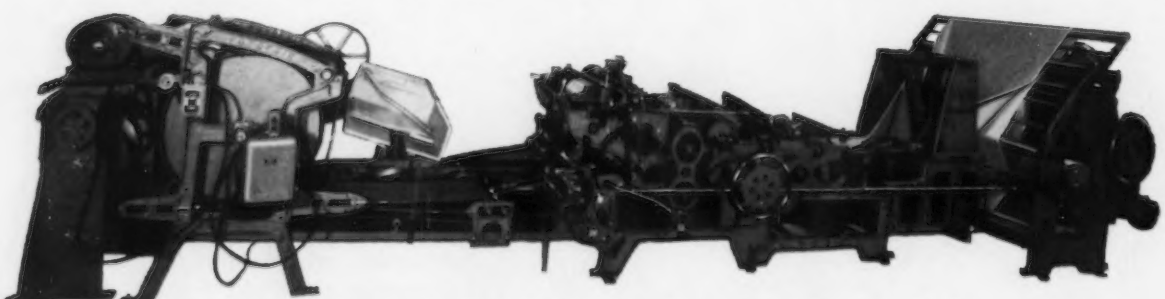
84RKJ	9¾" x 4¾" x 11½"	18" x 7½" x 23"
85R	7½" x 4½" x 16"	12" x 8" x 33½"
85RW	10" x 4½" x 16"	18" x 9" x 33½"
86R	10" x 6" x 20"	18" x 12" x 40"
88R	10" x 6" x 32"	19" x 15" x 62"



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Industry specialists authored this practical textbook on pulp and paper production...

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The *Lectures* can be used as a textbook to train foremen and to orient engineers entering the field. Executives, superintendents, engineers and chemists will also find this book invaluable. Every mill should have one or more copies for quick reference to provide figures, process details, and information indicated by subject file at left.

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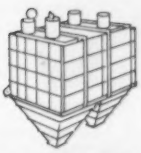

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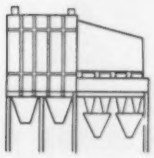

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(Continued from page 64)

R. F. Hoban

E. Crowley

Sandoz Inc. has appointed Robert Robert F. Hoban as chemist in the paper department lab in Cincinnati, Ohio.

Carthage Machine Co. has rehired Ed Crowley and stationed him in Atlanta. He has had many years of experience in producing pulp and paper and in selling to the industry, particularly as a wood-room specialist.

J. A. Nissen

A. Christensen

Denver Equipment Co. has appointed James A. Nissen general sales manager. He has been a Deco dealer in the San Francisco, Calif., area for the past two years.

Chemipulp Process Ltd. and Chemipulp Process Inc. have added Andreas Christensen to its staff. He recently retired as production manager at the Kimberly-Clark operated mill of the Spruce Falls Power and Paper Co. at Kapuskasing, Ontario.

His activities will consist primarily in extending the services of the Chemipulp Process companies to the pulp and paper manufacturers of the United States and Canada.

Hays Corp., Michigan City, Ind., has appointed Harlan Twible to the position of vice president, manager of marketing. Mr. Twible was previously sales manager of the Minneapolis-Honeywell sales office in Milwaukee, Wis.

G. J. Prager

T. Brumagin

Charles R. Stevens Inc., manufacturer of sheet finishing equipment, have appointed George J. Prager sales engineer with headquarters at the company's main office at Maumee, Ohio.

Mr. Prager has been engaged in consultant work for the past twelve years and has a complete background of experience with finishing room techniques and problems.

Ajax Flexible Coupling Co. Inc., Westfield, N. Y. has appointed Thomas H. Brumagin as general sales manager. He has been associated with Ajax for 11 years in executive capacities in engineering, production and sales.

Crane Co. has appointed William O. Brown, manager of its West Coast sales district, to be general manager of sales with headquarters at the company's Chicago general office. Mr. Brown will coordinate the plumbing, heating and industrial sales activities, as well as the marketing research and advertising-sales promotion departments.

Crane Co. also announced the resignation of J. W. Greene, vice president for sales. Mr. Greene, who was elected to the vice presidency in May, 1957, after 21 years of service in the company's sales activities, has been in ill health for several months.

American Cyanamid Co., Bound Brook, N. J. has named William D. Grafton assistant to the sales manager for dyes, Organic Chemicals Division. Formerly sales representative for the dyes department, Mr. Grafton will now be in charge of product promotion for the department.

Read Standard Division of Capitol Products Corp., York, Pa., announced yesterday plans to manufacture industrial filtration equipment. According to William J. Strandwitz Jr., executive officer, the company has developed entirely new concepts in filtration theory. It is presently perfecting prototypes of industrial filters based on this concept. Read Standard expects to introduce the new line in May.

Read Standard Division is a manufacturer of a diversified line of commercial bakery equipment, chemical and industrial processing equipment and special marine and highway products.

W. H. Plowman

J. P. Lonberger

R. L. Tarnow

Goulds Pumps Inc., Seneca Falls, N. Y. has named W. H. Plowman manager of its Tulsa, Okla. branch, replacing J. P. Lonberger who became manager of the Boston branch. R. L. Tarnow has been appointed manager of the company's Chicago branch.

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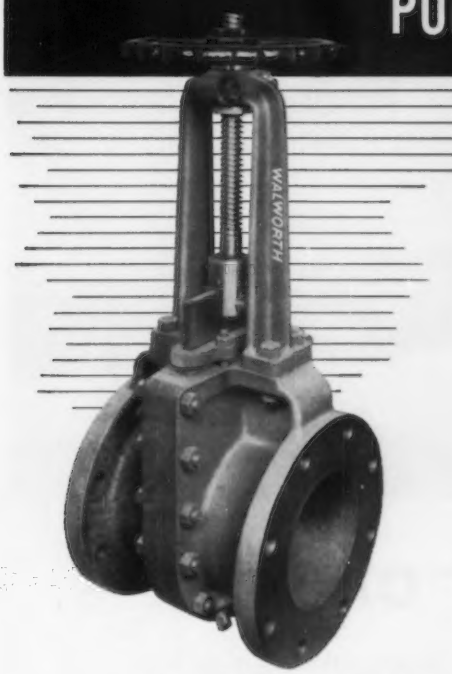

Featuring the No. 757F Pulp Stock Valve!

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The No. 757F can be supplied in sizes 4" to 24" inclusive – in All Bronze, Iron Body with Bronze Trim, Iron Body with Stainless Steel Trim, All Stainless Steel construction. Complete information is available from your nearby Walworth Distributor – or – write Walworth direct for a free copy of the booklet, "Walworth Valves for Pulp and Paper Mill Service".

and including these valves for "across-the-board" use!

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WALWORTH PRESSURE-SEAL CAST STEEL VALVES. Ideal for high-pressure, high-temperature steam and boiler feed service. Internal line pressure is utilized to maintain a tight, leakproof body-to-bonnet connection, reducing bulk and weight of valve.

WALWORTH No. 716 NI-RESIST SADDLE STYLE GATE VALVE. The OS&Y design prevents the fluid in the line from coming in contact with the stem threads. This design meets the requirement for a line of valves in small sizes for pulp and paper mill service.

WALWORTH No. 725FS OS&Y, FLANGED, SPECIAL ALLOY WEDGE GATE VALVES. Designed especially to retard caustic corrosion in the pulp and paper industry.

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WALWORTH LUBRICATED PLUG VALVES. Easy turning – quick operating. Lubricant can be renewed while the valve is in service. Lubricant completely surrounds the plug ports assuring a tight seal against leaks.

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For more than 50 years Magnus Metal has been specializing in custom-built valves for the paper-making industry. These valves are designed and built to meet your exact requirements, whatever they may be — for any of the following types: Blow, Gate, Globe, "Y", Swing Check or Safety Pop.

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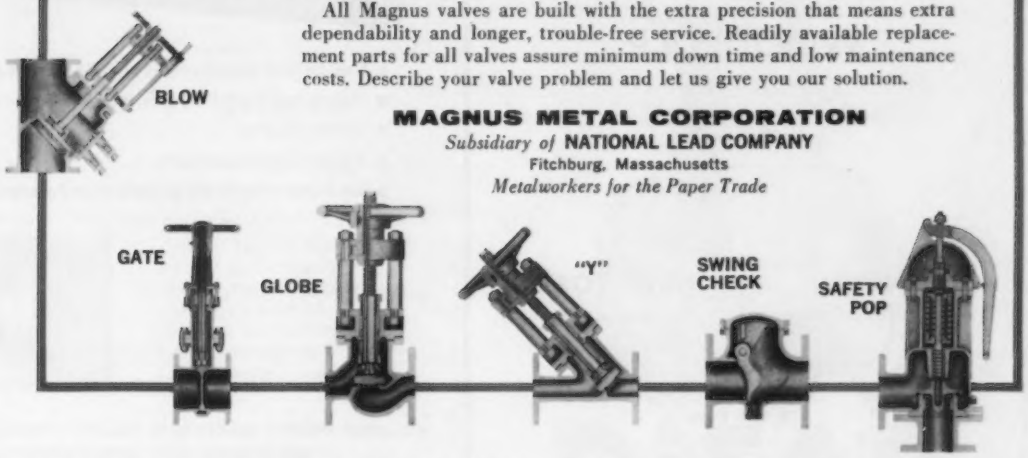

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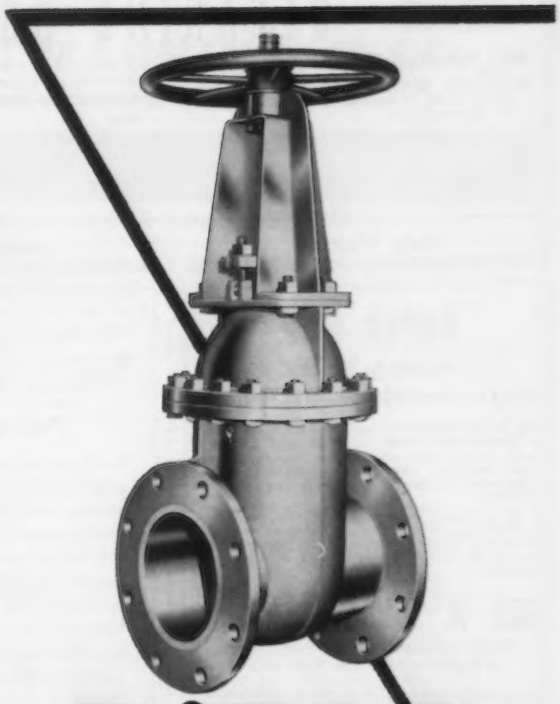

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Extractor Roll:	24″ dia. plain Downingtown with couch.
Vats:	4 Pusey & Jones Goldschmidt type, new 1940, with 4 Warren pumps.
Moulds:	4—48″ x 134″ with 5 HP gear motors, helper drive each mould.
Couches:	4 Rubber covered about 19″ x 136″ anti friction.
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1st Press:	Beloit 25″ suction press 145″ face, top r.c. roll.
2nd Press:	Straight ahead. Top roll 19¾″ brass. Bottom roll 18″ dia. r.c. Bottom felt 1 37½″ x 71 ft.
3rd Press:	Reverse. Top roll 19½″ brass. Bottom 18½″ R.C. Oscillating doctor.
Dryers:	40—48 x 130″ Pusey & Jones double deck. Top and bottom felt, 8—36″ felt dryers. Stickles control. Transite hood. 12″ dia. spring roll.
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Calenders:	3—126″. One nine roll and two seven roll. Box frame. Water cooled bearings. Bottom rolls 22″. Tops 18″. Intermediates about 12″ dia.
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Winder:	Langston two drum. 14″ dia. drums. Shear cut. Horton clutch. V belt drive.
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Speed:	220 on 120 lb. paper.

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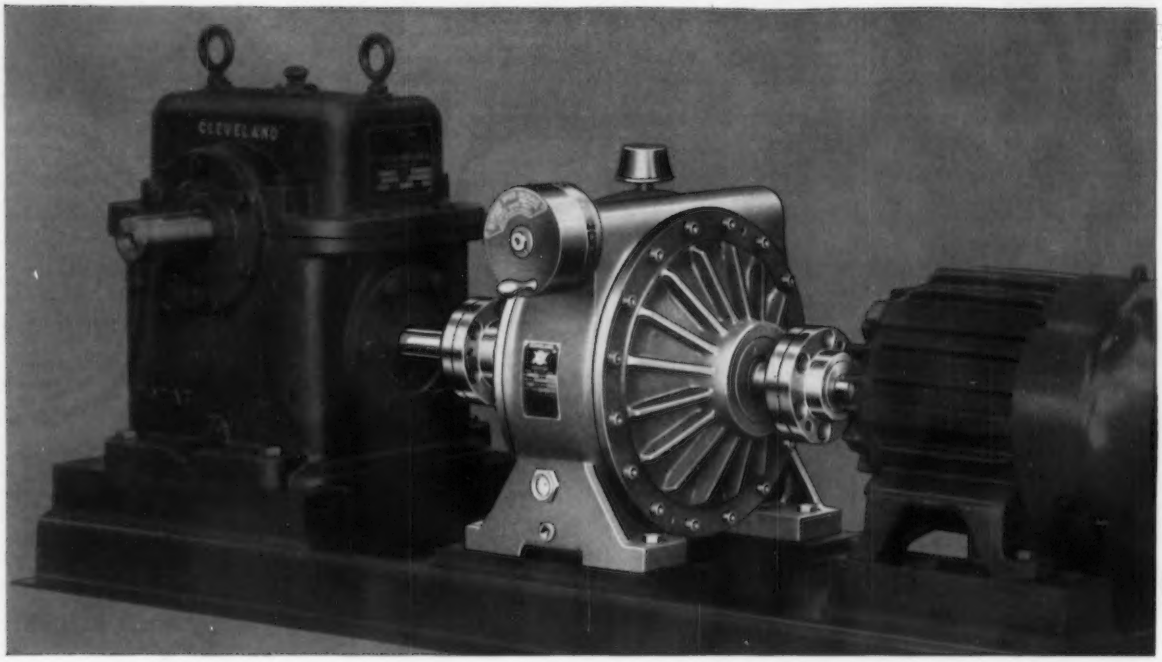

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IN installing a Cleveland Speed Variator, the higher the input speed (normally 1750 rpm), the smaller the unit needed. Where power must be delivered at speeds below the Variator's normal output shaft speeds, further reductions are available between Variator and driven equipment.

As illustrated above, the Variator may be assembled with a standard worm gear speed reducer or with integral double reduction helical gear trains. Write for Bulletin K-200. The Cleveland Worm & Gear Company, Speed Variator Division, 3252 East 80th Street, Cleveland 4, Ohio.

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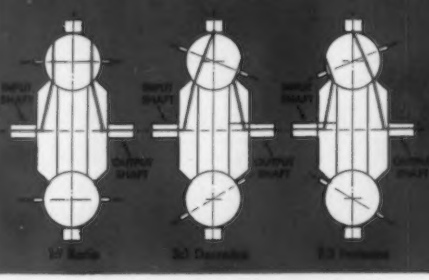

Power is transmitted from input shaft to output shaft through alloy steel driving balls which are in pressure contact with discs attached to the two shafts.

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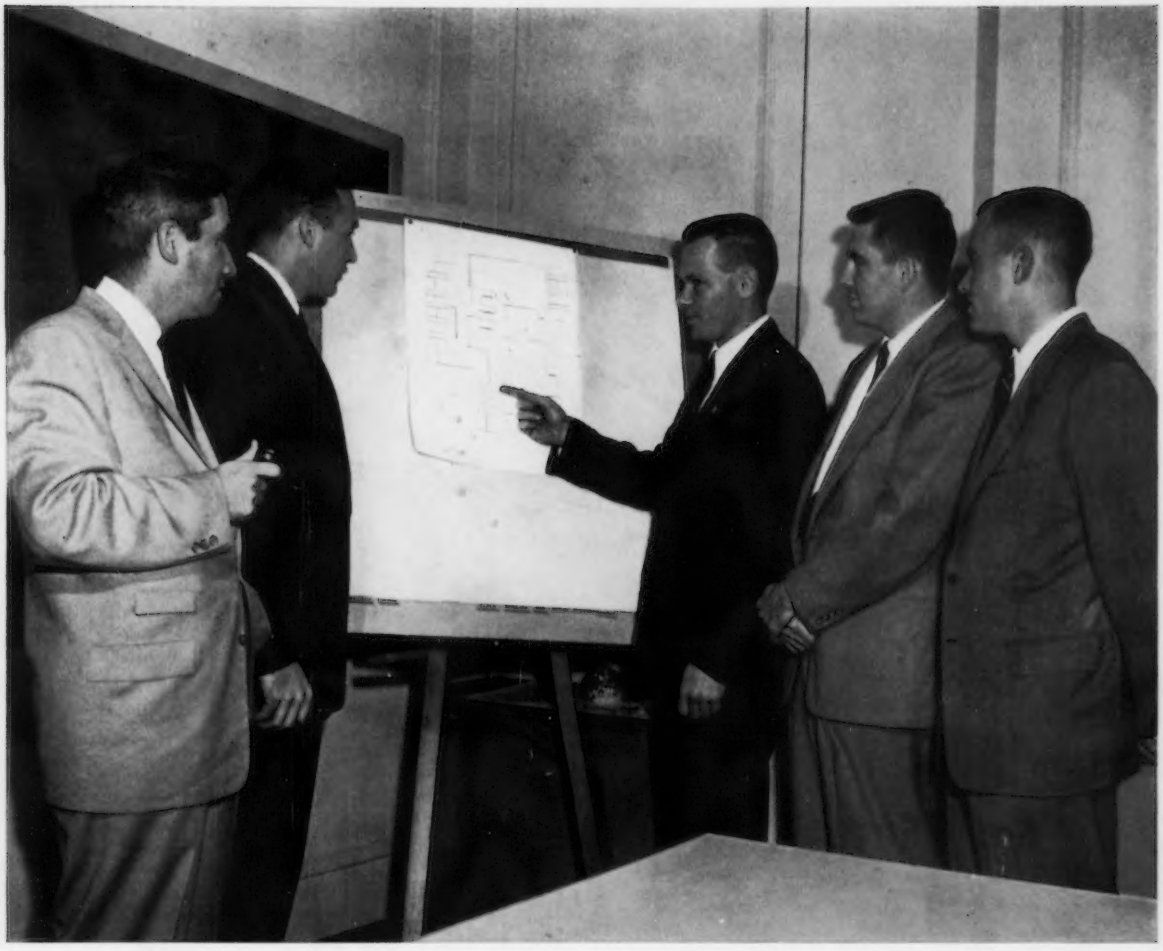

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Here are five Hercules technical representatives*, all specialists in the paper field, who attended the symposium to exchange information on current paper mill problems and manufacturing methods.

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**Left to right: J. MacAndrew, Chicago; G. A. Reasor, Detroit; J. Lawes, Los Angeles; G. Stelzer, Wilmington; R. Kitchell, New York City.*

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